

COAL AGE

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The Handling of Men

YEARS ago, "A Handler of Men" was one who was also able to man-handle his workers, with the aid of a pick handle if necessary. The idea prevailed that ability to manage others was born in a person and could not be acquired.

True, some men are born managers, but the art can be acquired if one will persevere. The chief requisites to success are good health, absolute honesty, square dealing, human sympathy, cheerfulness, good humor, firmness and initiative.

Most of these essential qualities are interlocked: Good health begets cheerfulness, and cheerfulness, like measles, is contagious. Soon the whole plant is infected. Honesty enables one to stand firm, for he is assured his cause is right. Human sympathy fosters confidence and loyalty. Initiative means courage. A manager must be alive and always ready to shoulder responsibility.

Most difficult to acquire is ability to "hand out a square deal." We are all bound by our likes and dislikes. Each day there are problems that must be looked squarely in the face. Our prejudices must be controlled so as not to run away with our judgment. A just decision may at first be unpopular, but appreciation will come in time.

"Handling men" simply means increased human efficiency. We aim to get maximum results from a minimum of effort. In the past, great strides were made in methods and machinery; costs were thereby cut and the human side of business neglected. Today mechanical improvements are coming slower and industrial advances, such as lower costs, must result from training and developing individual workmen. Machinery has passed the individual and the latter must catch up.

Success in handling men entails, first, choosing the right man for the job. It is nearly as great to choose the man to do a wonderful thing as it is to have accomplished that thing yourself. It requires brains to see the hidden qualities in the other fellow.

A mine official must know his men—their habits, their likes and dislikes, and their different traits of character. Close observation will discover abilities never suspected and seldom realized by the workman himself. Such a plan will soon catalog each employee—determining the particular job suited to him. The wise manager finds the man to fit the job and does not try to make the job fit the man.

Time was when imitation was thought to be a characteristic of monkeys, but the modern idea is that imitation is a big factor in the education of labor, provided the copy set up to be followed is near perfect. Pick out a safe and efficient workman, put the untrained men in his charge and soon the plan, through the medium of observation, will develop a number of efficient employees.

The wise manager mixes efficient workmen into every bunch of new employees. The less efficient quickly learn to imitate the others. Surly and selfish men soon corrupt an entire group; they should be weeded out. Men imitate the bad as well as the good.

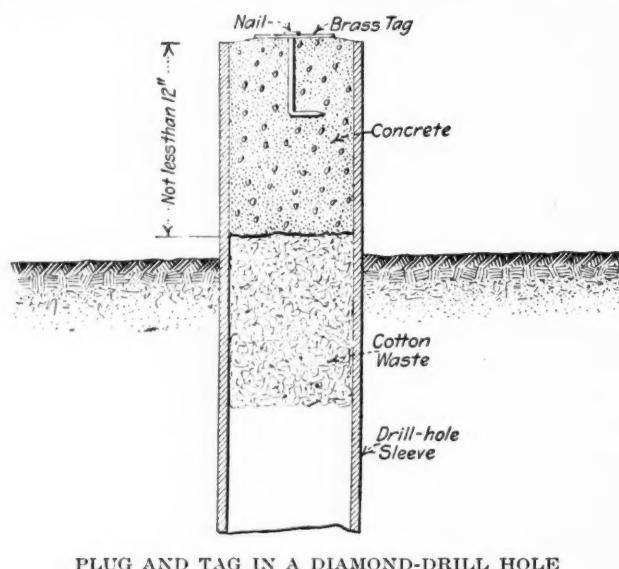
We first imitate, then attempt to excel. Mine Foremen and Superintendents should endeavor to encourage competition. It is a great thing to have a lot of men who are busy trying to surpass past records. Every organization should have certain sections competing, one with the other. However, avoid creating jealousies and discourage all attempts of some individuals who would win by hindering others. Competition is harmful if it destroys comradeship.

An executive to whom the men turn in time of difficulty and distress is the kind of man who will receive devoted service when the company is in need. Loyalty is reciprocal.

Ideas and Suggestions

Plugging Diamond Drill Holes

There are various ways of plugging and marking diamond drill holes, including wooden plugs, pipe caps, etc.; but the method shown in the illustration serves the purpose admirably, with distinct advantages over the



PLUG AND TAG IN A DIAMOND-DRILL HOLE

two methods mentioned. It consists of the use of a drill-hole sleeve, concreted into position as shown in the illustration. The concrete is solid and permanent, nondecaying and resisting the efforts of any curious person, besides providing an excellent base for the nail to anchor the brass number tag. The cotton waste is pushed into the sleeve and acts as a base for the concrete to rest on before it sets. It is an easy matter to saw off the plugged part of the pipe with a hacksaw if it becomes necessary.—*Engineering and Mining Journal*.

Practical Ability

There are a large number of men interested in coal production who really understand the science of mining, but who nevertheless would not be able to succeed in the management of a mine. The best authorities on mining are not the greatest managers. It is not the artists, statesmen, or generals of first rank, who give us the standard works on art, government and military tactics. A man who is a genius in the theory of commerce and finance may prove to be the poorest sort in everyday business life.

But the business man, if he is to succeed in his profession, must be able to carry out the completed theory of his own field of effort. Without practical ability an engineer may well enough plan a large mine, but some other worker must open or develop the mine in order that the plan may prove successful.

There are many practical thinkers, but they are not always practical doers. Thinking along certain lines is merely dreaming, and dreaming does not accomplish anything. Some men always overuse the power they possess, in getting ready for an undertaking. Washington Irving tells of a Dutchman who had a ditch to leap and who went so far back from the ditch, in order to make a run and secure momentum, that when he reached the edge he was completely fagged and had to sit down and recover his breath. Why not adopt this slogan? The best for the money, in the quickest time, largely disregardful of all relatively unimportant matters and forever working straightaway for finest results.

Testing Scales for Sensitiveness

The accuracy of mine or track scale weights depends largely on the proper adjustment of the bearings. The sensitiveness of a scale indicates the condition of the bearings. A good way to discover the sensitiveness of scales is as follows:

First, balance the scale. Then place a weight, of say 200 lb., on the scale. Then move the scale pea two notches to the right or left on the beam, which should cause the beam point to move an equal distance up or down the trig loop. If there is a variation in the distance through which the beam point moves up or down in the loop, the scale is undersensitive and the bearings should be looked after and adjusted. Different size weights can be used, depending on the size of the scale and whether it is a mine or a track scale.

Special Trolley Wire Suspension

For the operation of electric industrial railways which must be capable of withstanding high temperatures such as are encountered in coke, smelting and



SPECIAL INSULATING SUSPENSION FOR TROLLEY WIRES

founding plants, special types of overhead line material may be employed advantageously.

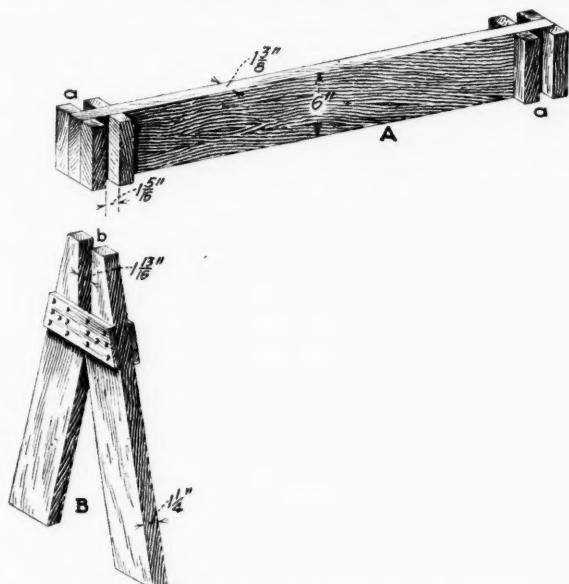
The General Electric Co., of Schenectady, N. Y., has developed a special insulating suspension for trolley

wires. It is made of malleable iron, porcelain and cement, to meet high temperature conditions, and gives efficient service on voltages up to 600.

The Form P suspension, as it is shown, insulates the trolley wire from the cross span or bracket. It has a porcelain body into which is cemented a specially designed stud capable of withstanding stresses up to 3 tons. A malleable-iron span yoke for attaching to the span wire is provided, and a malleable-iron wheel guard affords protection against "wild" trolley poles.

A Handy Trestle

The sketch shows a trestle which may be readily taken down and stored in a small space and without danger of breakage. The top bar is provided with



TRESTLE OCCUPIES LITTLE SPACE WHEN KNOCKED DOWN

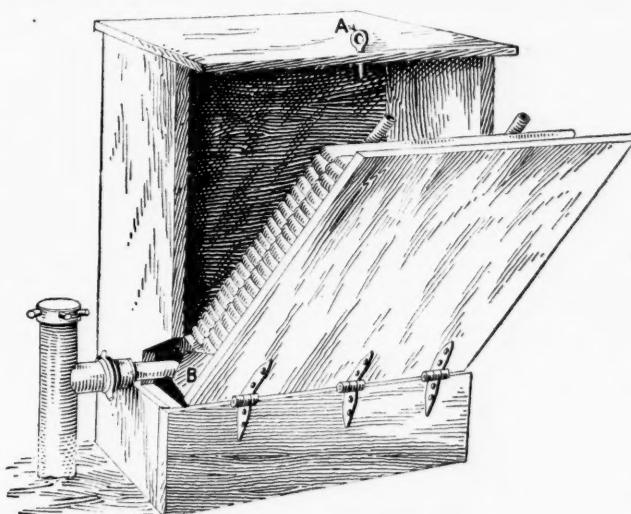
grooves at each end formed by nailing strips of wood on each side to a bare clearance for the upper ends of the legs. The legs are framed with a slot at the top which is a close fit for the top bar.—*Engineering News-Record*.

Outside Rack for Fire Hose

Fire protection for industrial plants is an important branch of safety engineering. Adequate fire protection cannot be had without proper care and easy accessibility of fire-fighting apparatus. The illustration shows a serviceable and convenient hose rack for mills, smelters and mine plants. It consists of a wooden frame about 4 ft. high, 5 ft. long and 12 in. wide inside, covered with corrugated iron, preferably galvanized, with top hinged in the rear and front hinged at the bottom, the two doors, or lids, being held together by the pin *A*. At the bottom of the front door is a shelf so fastened to it that the two move together. The rack is placed with one end about a foot from the fire plug, and at the bottom of that end a piece is cut out, as shown; the triangular portion *B* of this piece is fastened to the front door.

The hose is piled upon the shelf and the plug end is brought out through the rectangular opening at

the bottom of the rack. In case of fire it is only a few seconds' work to pull out the pin *A*, allowing the front door to fall forward, and drag the nozzle end of the hose to the fire. The triangular opening in the end of the housing gives plenty of clearance for the hose, which, carefully piled upon the shelf, pays out readily. As the hose is always fastened to the plug, there is no time lost in making connections and water can be on the fire as soon as the nozzle men are ready.

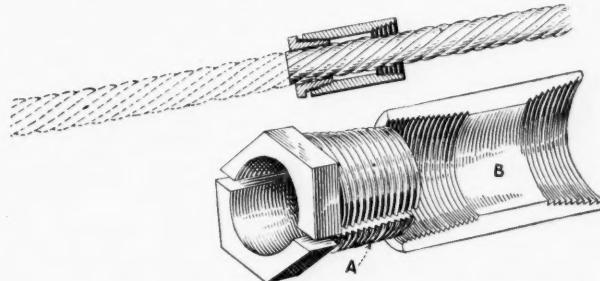


OUTSIDE RACK FOR FIRE HOSE

The short piece of hose exposed between housing and plug can be protected by an extra box placed over it. This rack is inexpensive, takes up little room and answers every purpose. The device is obviously simple to construct and furnishes a means of protecting the hose from dust and weather conditions, while providing immediate readiness when necessary.

Simple Cable-End Protector

Difficulty is frequently experienced in keeping the end of a newly cut cable from unwinding. To prevent this, the device shown in the accompanying illustration was hit upon. It consists of a suitable reducer split in halves and a coupling. As will be seen by reference to the illustration, *B* will be pushed along the cable



END PROTECTOR FOR STOCK CABLES AND GUYS

until it reaches the point to be cut. The two halves of *A* are now placed on the cable and screwed into the coupling. The tapered thread will force the split reducer to close on the cable and act as a clamp. The device also prevents the hacksaw blade from breaking, caused by the opening of the cable end. The material for this device can be procured at a small expense.

Screen Scale for Coal-Testing Work

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DURING the past few years there has been a tremendous increase in the amount and variety of laboratory and other test work performed on coals. Most work of this character involves comparative sizing or screening tests by which the relative amounts of different sizes of coal in a particular lot may be determined. As examples, consider the following:

A tipple screen is to be designed to suit a certain coal. Screen tests are advisable as a preliminary in order to determine relative proportions of large and fine coal, that the most economical areas may be given to the different sizes of plate in the tipple screen. In a rescreener in which several sizes of small coal are to be made, the need of preliminary sizing tests is still more obvious. In the preliminary tests for a washery, valuable data as to the comparative bin and jig-bed area are secured from the same sort of sizing tests. A fourth example familiar to the mechanical engineer is the determination of comparative coarse and fines in his fuel that he may regulate the firebox, grate and draft conditions for the particular sizes contained in the coal furnished to him.

Other examples which readily suggest themselves are the testing of coal for degradation products under conditions of preparation, of shipment or of storage. Comparative tests of efficiency and products from coal-cutting and coal-crushing machinery are important, and many other conditions might be added, where sizing or

screening tests on a larger or smaller scale will aid in the solution of mining problems.

It is a pity that so many different kinds and sizes of screens have been used in such tests. Some engineers have used bar screens with a certain width of bar space to designate comparative size, others have used a set of wire-cloth screens with the size of hole designated by the diameter of the square opening, or in some cases by the distance from center to center of wire. Still others use round-hole screens of various sizes. The confusion caused when endeavoring to compare such test work is realized from the fact that approximately a 1-in. square hole will pass 1½ times as much of the same coal as a 1-in. round hole, and that a 1-in. space-bar screen will often pass from 1½ to twice as much as a 1-in. round hole.

Even with the same kind of screens there is no regular order in the succession of sizes of holes used. One screening test is reported as amounts and percentages passing successively over a 1½-in. round hole, a ½-in. round hole, a $\frac{9}{16}$ -in. round hole, a $\frac{5}{16}$ -in. square hole, and through a $\frac{3}{16}$ -in. square hole. When asked why, the answer was made that a certain mine followed this standard and therefore it was necessary to do likewise. A recent test on degradation after storage compares the percentages remaining successively on a 3-in. round hole, a 2-in. round hole, a 1-in. round hole and a ½-in. square hole and passing through

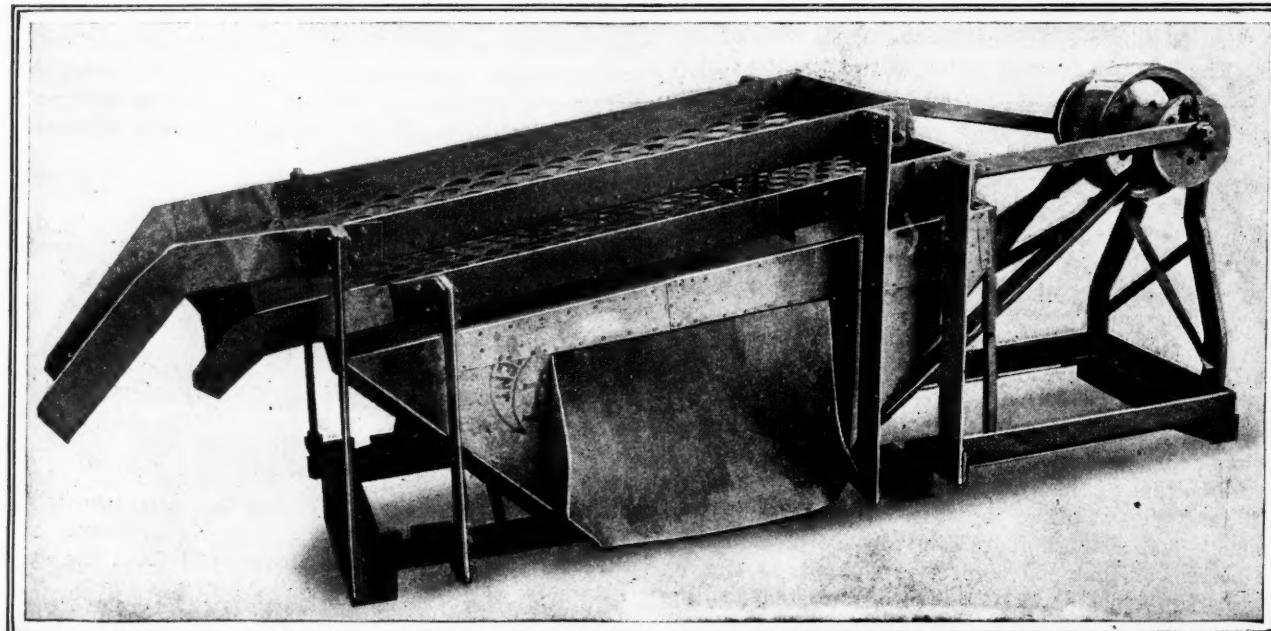


FIG. 1. POWER-DRIVEN COAL-TESTING SCREENS IN USE AT THE UNIVERSITY OF ILLINOIS

a 1-in. square hole. The reason for selecting these sizes was that they could be obtained handily.

Why do not coal-mining engineers and investigators adopt some special set of screens as a standard, with which all investigation work can be done and the results collaborated? Immediately there comes to the reader's mind that some one is trying to standardize coal-screening practice and that this cannot be done on account of differences in customs in different districts, different market conditions and different character of coals. The answer is that no such standardization of sizes is being advocated, but only that there shall be introduced into coal-testing work some standard practice in screening, and incidentally such a standard as

mm., while the fourth root of 2 is used as the ratio for openings below 1 mm. to give more sieves in that part of the scale. The sieves are to be designated not by the number of meshes per unit length, but by the width of the opening in millimeters, as a 1.41-mm. sieve or a 0.36-mm. sieve." The screens have wire cloth with square openings.

There are a number of reasons why such a scale is admirable for ore-testing work and not at all applicable for ordinary coal-testing work, among which are mentioned the following:

1. The holes are square instead of round. In ore-dressing practice much screening work is carried out with square-mesh wire screen; thus the test results are

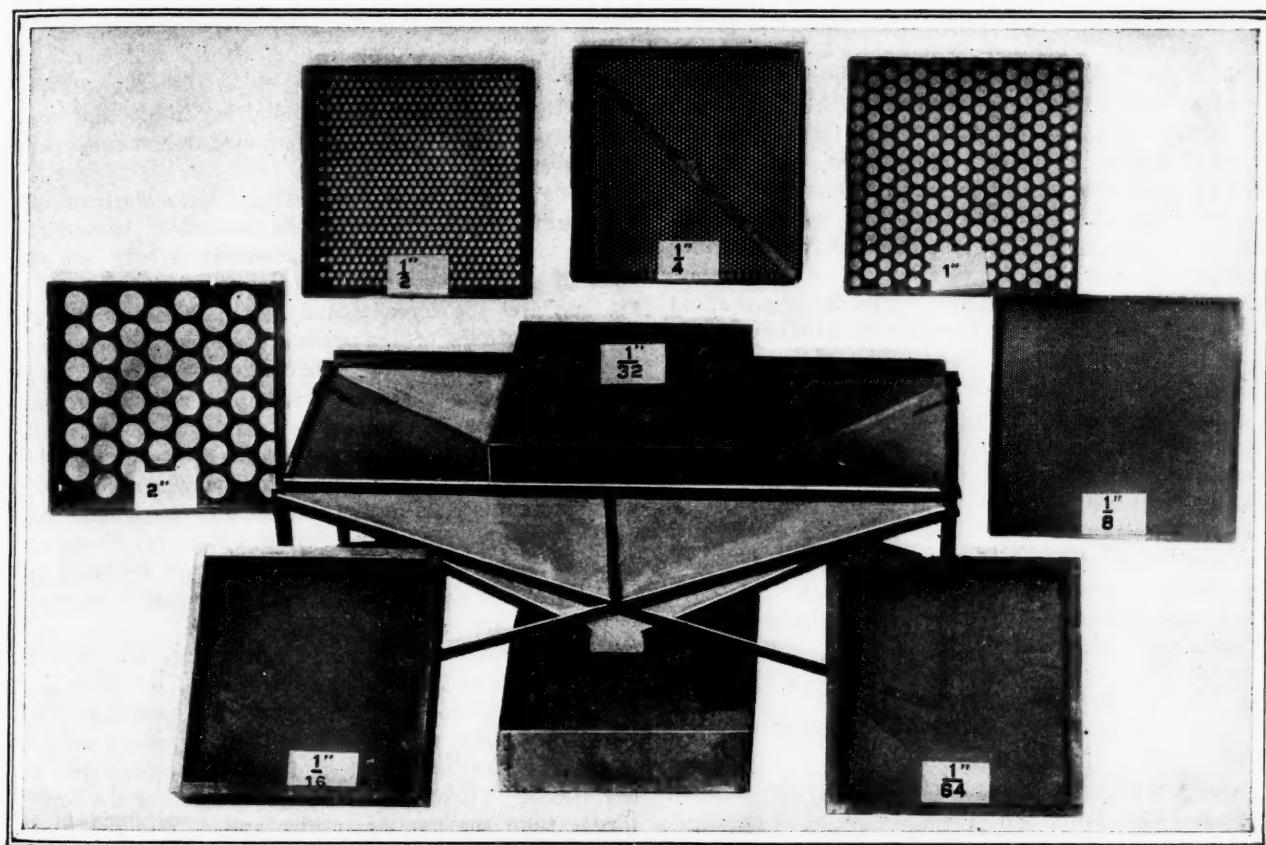


FIG. 2. SERIES OF SCREENS WHICH IT IS PROPOSED SHALL SERVE AS A SCREEN SCALE

can be transposed immediately and effectively into terms of commercial sizes with the least confusion and its results utilized.

It will be known to many that engineers and metallurgists engaged in testing work on ores, and in general, metallic and nonmetallic minerals excepting coal, have adopted, after many years of effort, a standard screen scale for comparative testing work. A recent statement issued by the United States Bureau of Standards regarding this says:

"The screen scale adopted is essentially metric. The sieve having an opening of 1 mm. is the basic one, and the sieves above and below this in the series are related to it by using in general the square root of 2, or 1.4142, or the fourth root of 2, or 1.1892, as the ratios of the width of one opening to the next smaller opening. The first ratio is used for openings between 1 mm. and 8

often applicable directly to practice. In coal preparation the shaker screen seems to have almost a monopoly in modern sizing work. This screen always uses round-punched screen plate, partly owing to its strength and partly to its smoothness of surface, thus allowing the coal to slide over it with minimum slope and breakage. While square holes are occasionally used with the plate screens; the cheapness, strength, freedom from wear and exact sizing qualities make round-punched plate the overwhelming favorite. From this it may be assured that the round hole will be used universally in coal preparation.

2. The sizes are listed in millimeters instead of inches and are, therefore, not readily applicable in practical coal work. While this does not injure the value of the scale for ore-testing work it would be a serious and troublesome handicap in investigations into the screen-

ing of coal. The reason is that a set of screens in an ore-dressing plant are peculiar to that particular plant and ore. A change to the millimeter system of measurement of holes involves no change outside the plant. With coal the particular sizes made are almost trade names, and it would be necessary to educate the general public to have coal screens designated in the metric system. I cannot well imagine my retail dealer offering me 15-cm. bituminous lump.

3. The majority of sizes listed in the scale of the Bureau of Standards are under 1 mm. This is suitable to the grading of ore, cement and like materials, where great importance may attach to comparative percentages that are under 100 or even under 200 meshes to the linear inch in size. With ordinary coal work, most of the commercially valuable sizes are at least above $\frac{1}{8}$ in. in diameter. Even in coal washing the limiting size it is possible to treat is only slightly smaller. Concerning this, F. Jungst (Gluckauf, 1914, Vol. L, pp. 6-10) says: "Though laboratory tests give 0.012 in. (0.3 mm.) as the smallest grain of coal that can be settled in water, the minimum we may attempt to settle in practice will vary from 0.02 to 0.008 in. (0.5 to 0.2 mm.)." Consequently, smaller sizes than these cannot be washed successfully.

4. The testing screens used for ore work are small in area and capacity, 8 in. in diameter being a common dimension. This is satisfactory for the finely pulverized ore. In coal-testing work, since the sizes tested are much larger, larger quantities of coal must be used to get representative samples; consequently, screens of larger area must be employed.

For all coal-testing work in the mining laboratory of the University of Illinois, I have adopted a standard set of coal screens, and I propose that such a set shall be adopted as a standard for coal-testing work.

The base screen of the series has round holes of 1-in. diameter. For screens above this size a ratio or multiplier of 2 is used; and for screens with holes below 1 in. in diameter a multiplier of $\frac{1}{2}$ is used. In each case the holes are round and punched in steel or brass plate. Thus the proposed scale calls for the following diameters of round-hole screens: 8-in., 4-in., 2-in., 1-in., $\frac{1}{2}$ -in., $\frac{1}{4}$ -in., $\frac{1}{8}$ -in., $\frac{1}{16}$ -in., $\frac{1}{32}$ -in., $\frac{1}{64}$ -in.

By this scale, the area of any hole is 4 times the area of the next smaller hole. The screens should be

designated by the diameter of the hole. If necessary, above 1 in., an intermediate series can be put in by adding screens with 6-in., 3-in. and $1\frac{1}{2}$ -in. round holes. It is not necessary to use all the above sieves in a test, as often $\frac{1}{8}$ in. is as small as is necessary. The lower limit of the scale, a $\frac{1}{64}$ -in. diameter hole, is about as small as round-punched plate is manufactured. This is

EXAMPLE OF WORK DONE IN COAL-SCREENING TESTS

	Coal No. 1, Run of Mine	Coal No. 2 Run of Mine	Coal No. 3 2-In. Screenings
Percentage Screens	Added or Cumulative Percentage	Added or Cumulative Percentage	Added or Cumulative Percentage
On 4 in....	38	9	9
On 2 in....	19	57	26
On 1 in....	12	69	40
On $\frac{1}{2}$ in....	8	77	54
On $\frac{1}{4}$ in....	6	83	70
On $\frac{1}{8}$ in....	5	88	81
On $\frac{1}{16}$ in....	92	8	89
On $\frac{1}{32}$ in....	thru 12	thru 11	93
On $\frac{1}{64}$ in....			6
Thru 1 in....	100	$\frac{1}{16}$ in.	96
			3
			96
			4
			100

below the usual necessary coal-sizing limit and only special pulverized fuel and coal-dust tests ever need a finer screen.

Fig. 1 shows the power-testing screen designed by the department and used in the laboratory to test the larger sizes or considerable amounts of the smaller sizes of coal. The screen frames are 2 ft. wide by 5 ft. long and the screen plates can be slid out and replaced by others of the standard series. This screen has a capacity on the smaller sizes of coal of up to 5 tons per hour. The side rods are ash strips $\frac{1}{2} \times 4$ in. About 1 hp. is required for driving.

Fig. 2 shows the screen frames used in such a series, together with the screening tray which saves much labor in hand screening the considerable amounts of coal usually tested. The screen frames are 18-in. square and of steel plate. They have steel screening surfaces, excepting in the smaller sizes where wooden frames and brass plate are used.

With many coals it is not important to carry the screening beyond the $\frac{1}{2}$ - or $\frac{1}{4}$ -in. screen, in which case the series may end with the percentage through $\frac{1}{2}$ or $\frac{1}{4}$ in. By adding the successive percentages from top to bottom the added or cumulative percentages are arrived at. These show what percentage of the coal is larger than the particular size and is also useful for plotting purposes.

Directions for Plotting: Fig. 3 represents the curves of the three coals just listed. Starting on the right at the bottom, lay off in succession to the left each of the screen sizes, doubling the distance each time between the successive holes. These points develop the screen scale. If desired, the sizes may be spaced at regular intervals. At the right lay off vertically percentages from 0 to 100. For coal No. 1 the cumulative percentages read 38, 57, 67, 77, etc. Mark 38 per cent. on the 4-in. line; 57 per cent. on the 2-in. line; 67 per cent. on the 1-in. line, etc. The last ordinate will be 100 per cent. and will show the coal going over or through the screens. Connecting the points gives a curve which may be called the characteristic curve of the coal in question. In the same way curves Nos. 2 and 3 may be developed. A little practice enables one to note at a glance that coal No. 1 is essentially a coal containing few screenings and little bug dust, while coal No. 2 contains little lump and much dust.

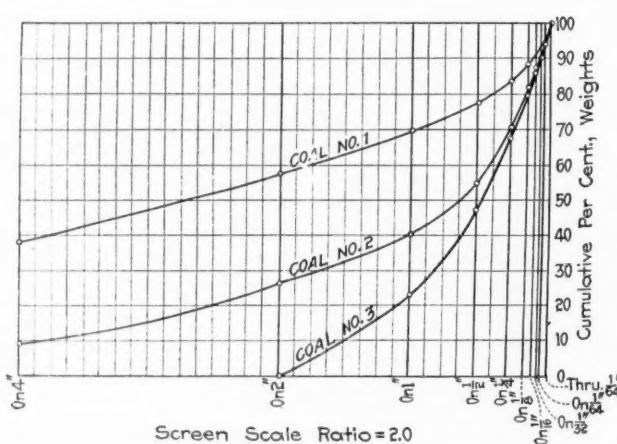


FIG. 3. CURVES CHARACTERISTIC OF RELATION BETWEEN SCREEN SIZE AND COAL SCREENED OUT

Developing the same screen scale by means of a logarithmic plot brings the curve into more compact form and may be used instead of the foregoing direct plot.

The general scheme outlined has been criticized because it does not recognize many of the usual sizes of coal prepared for market; for example, $\frac{3}{4} \times 1\frac{1}{4}$ -in. nut, $1\frac{1}{4} \times 2$ -in. nut, or 5-in. round-hole lump. The answer to this objection is simple. If one wishes the percentages of $1\frac{1}{4}$ -in. screenings in any of the coals plotted, it is only necessary to proportion the distance between 1-in. and 2-in. on the bottom line to obtain the $1\frac{1}{4}$ -in. line; then follow up this line until it cuts the curve and the required percentage over or under this size will be given. From this it may be asserted that the proposed screen scale may be used and transposed into any commercial sizes.

The chief objections to the proposed scale may be summed as follows: It adds another standard into the already complicated screen field, and for reasons previously stated the smallest screen is limited to about $\frac{1}{4}$ in. in diameter. It is granted that special tests made with coal dust 100 mesh and finer will require the standard wire screens.

The arguments for the proposed scale are as follows: (1) It would place all coal-testing work on the same basis for universal comparison; (2) it follows a simple ratio; (3) it needs for the results obtained no conversion of sizes or quantities to be applicable immediately in practical work and sizes; (4) it proposes screens that are cheap, of ample capacity and of long life; (5) it replaces a system unsuited to coal screening by one well adapted to material like coal of such size that $\frac{1}{4}$ in. or even $\frac{1}{2}$ in. represents the minimum diameter necessary for commercial testing work.

pillar-and-stall method is again followed in the removal of this seam.

As there is only 10 to 12 ft. of cover between the two seams, the Wee Shale is more easily obtained by this method than the main seam; of course, much more timber is required, and it has to be renewed at times owing to the creep on the workings after the withdrawal of the main seam.

Shale is much harder to mine than coal. One method is to undercut it with shots, as many as six shots being required to cross a place 12 ft. wide and 4 ft. deep. The shale is then shot down with two bottom shots about 3 ft. in height and two top shots about $5\frac{1}{2}$ ft. in height.

Owing to the shallow nature of the shale, there is only a small quantity of marsh gas given off, and there is seldom an explosion of firedamp. In some of the mines a considerable quantity of blackdamp is given off, especially in sections where the pillars are being withdrawn.

The shale miner always commands better wages than the coal miner, owing to the shale being harder to mine and heavier to handle than coal. When the shale is taken from the mine it is put through a crusher, then dumped into a system of retorts and retorted.

The gases given off are forced through a system of pipes, where they cool off and form a liquid crude oil. This oil is then refined and the different oils separated, the chief products being mineral oil, or paraffin, petrol, naphtha, tar, wax and sulphate of ammonia.

The oil shale companies are among the most prosperous concerns in Scotland and the shale miners the most content in the mining industry, they being assured of good wages and steady employment all the year round. The operators get fair profits for their products and a ready market. The sulphate which is used as an artificial manure, finds a good market among the owners of the tea and coffee plantations of Ceylon and India.

Oil Shale Industry of Scotland

BY J. L. BROWN
Herrin, Ill.

The oil-shale industry is wholly modern, having attained considerable magnitude since it was established in 1851 and the years following. Linlithgowshire, in Scotland, yields nearly three-fourths of the total output, about one-fourth being produced in Mid-Lothian and a small quantity in Lanarkshire. The removal of the shale is by the stoop-and-room (pillar-and-stall) method.

Rooms are driven 12 ft. wide and 5 ft. 6 in. in height, and from 40 to 60 ft. square, this method being continued until the boundary is reached, when the pillars are withdrawn in rows. Stumps are left in only where it is necessary to protect the buildings and public highways on the surface. When the pillar is worn out, the timber is withdrawn and the roof allowed to settle.

The shale seam is very shallow, cropping out on the surface in many places and at no time having a great amount of cover. For this reason, when several pillars are withdrawn, the surface settles down. There are two seams of shale in the northern part of Linlithgowshire, the main seam, or Broxburn, averaging 6 ft. in height and the Wee Shale from 7 to 8 ft. in height. The Wee Shale is the upper seam, and after a territory or section of the main seam is worked out and the covering has settled, roadways are driven into the Wee Shale, and the



STEEL HEADFRAME OF THE BALTIMORE COLLIERY,
DELAWARE & HUDSON CO., PARSONS, PENN.

Cost Accounting for Mine Engineers

BY H. H. STOEK

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SYNOPSIS—The developments from an elementary system of keeping track of business transactions have been many and along a number of diverse lines, but within the past decade particular and increasing attention has been given to one phase of the subject that is of particular interest to the engineer; that is, cost accounting. This matter has recently attained a position of unusual interest due to the coal conferences in Washington.

THE development and study of cost accounting has been parallel to and forms a necessary part of the development and study of scientific management and efficiency methods. A distinction should be made between ordinary bookkeeping or financial accounting and cost accounting, and the following notes are considered from the standpoint of the engineer and not from that of the expert accountant or bookkeeper. A man may keep books and at the end of the year know that he has lost or gained so much during the year, but it may not be discoverable from the books why or how he has gained or lost, nor by what means he may hope to gain more or less during the coming year.

A cost statement is too often considered only as history—that is, as a record of something that has passed—while an equally important function should be its use as a guide for future operations.

From a properly prepared cost sheet a manager or superintendent can tell at his desk what is taking place about the plant and can pick out the weak spots and go after them. This does not mean, of course, that a mine can be directed wholly from an office, but that with a proper cost sheet before him a mine owner or manager can keep in much closer touch with his mine than when he is dependent solely on a personal inspection of the operations. Properly prepared cost sheets also act as a stimulus to the operating force, for if they know that every detail is being presented in dollars and cents and is being scrutinized by the management, much greater care will be taken in organizing and carrying on the work. Useless labor will be dispensed with and a minimum of material will be used. This will apply not only to the direct charges, but equally to indirect charges which are too frequently a source of loss. In no business is oversight more difficult than in mining, for the men work in small groups and close supervision is impossible; hence every device should be used to keep the superintendent or manager in touch with all parts of the work, and detailed cost sheets should be one of his most useful tools.

A mining company that operates a large number of mines, all of which are within comparatively easy reach

of the central office, has made up every night a cost sheet for all of its mines for the preceding day and a copy of this is put into the hands of each superintendent every morning before the mine begins operation. While such quickly compiled sheets cannot be absolutely accurate and cannot give all of the details that will be subsequently tabulated, and are, of course, subject to future revision, they give each superintendent a graphic idea of his own operations for the previous day and for the current month to date, and also show corresponding figures for other mines and thus induce competition.

When a superintendent knows that he must daily explain to headquarters over the telephone the reason for unusual cost items, he is much more apt to keep close tab on the details of the mining than when he knows that the report is made up only monthly. Such daily exhibits are not, of course, always possible or may not be advisable, but when used they certainly tend to keep the man on the job on his tiptoes and go a long way toward cutting out slack supervision. While it may not be practicable in most cases to extend such daily reports down the line to the under officials, the fact that the head office is keeping such close watch on the daily details and reporting them to the superintendent must make for more thorough and systematic supervision.

In many cases the present superintendent, manager and possibly the owner have been trained in smaller mines than the ones they are now operating, and where the conditions were such that those in charge could have an intimate knowledge of all the details of the business. With the great increase in the size of plants and diversity of equipment this close supervision of detail is not possible, and the person in charge must have accurate data that he can study closely if he is to keep in touch with the operation of his plant. Many spend large amounts upon new and improved equipment but do not know what the equipment is doing after it has been installed.

Proper cost keeping shows the cost of every element and process entering into the final product and should be so presented that the person in charge can detect at once excessive cost items.

The operating man is, therefore, interested in costs as one step toward securing better operation and he should always be consulted in working out the cost system. An accountant is interested in costs as costs—not as a tool to secure better operation—and

he is apt to multiply items which may be of interest to an accountant but which do not increase efficiency and unduly increase the clerical work of the operating man.

A proper cost system should therefore show, not only what a product costs, but why. A system that merely shows that one thousand tons of coal cost \$1000 or \$2000 to produce may answer the requirements of simple book-keeping, but it is not a cost-accounting system. While

Operators should give the subject of costs the attention it deserves. A majority of the business failures in this country can be attributed to poor accounting and inadequate business information. Bad office methods, inadequate and unreliable costs of production and distribution cause a great deal of unfair competition.

the primary object of an accounting system may be to show the exact cost of production upon which to base a legitimate and suitable selling price, a suitable cost system should do not only this but should be so detailed and itemized as to permit a study of all of the processes entering into production so as to show up any excessive items, wasteful leaks, fluctuation in items from time to time, etc., and thus lead to greater efficiency in operation, closer supervision of operations and lower costs.

The two purposes of a cost-accounting system are therefore: (1) The book-keeping aspect, or the determination of the actual cost upon which to base a selling price; (2) the engineering aspect, which wants the itemized information upon cost with a view to better organizing and operating the business.

So long as costs are not known there will be ruinous competition. It is of importance, therefore, to every mine operator, to every stockholder in a mining operation and to every workman, that interest be awakened in cost accounting and accurate costs obtained. The competition most feared is that of companies that do not know actual costs and which sell their product at less than actual cost, although frequently thinking that the selling price is based upon the cost of operation. There is very little satisfaction to a company that keeps accurate costs to know that a competitor must ultimately be ruined through lack of knowledge, for meanwhile all other competitors must suffer.

The most accurate cost systems are usually found in connection with operations where but a few standard articles are sold. As the variety of output is enlarged cost keeping becomes more difficult and expensive. In coal and many other forms of mining there is but one product and it should be comparatively easy to follow up the several steps necessary to obtain an accurate knowledge of the cost of a ton or other unit of the product. In spite of this fact comparatively few mining companies have definite cost systems.

The closer the margin between production price and selling price the greater the necessity for a careful analysis of the cost of production. A monopoly or a business in which the profits are abnormal does not need the same close supervision to insure its continuance as does a business where the margin is small and the competition keen, as is the case with many forms of mining.

Some of the advantages of a suitable cost-accounting system are, therefore: (1) If the exact cost of production is known, a selling price can be determined that will give a legitimate profit. (2) It should show if the business is profitable or losing. If profitable, whether each division of the business is contributing its proper share of the profit. If the business is losing, it should show where the losses occur and should form a guide upon which to base the future condition of the business. (3) It should furnish definite information upon which to standardize and improve the operation. (4) It should show whether buying of materials has been judiciously done and whether the materials purchased have been

A suitable cost system should be so detailed and itemized as to permit a study of all the processes entering into production so as to show up any excessive items, wasteful leaks, fluctuation in items from time to time, etc., and thus lead to greater efficiency in operation, closer supervision of work and lower costs.

economically used and properly accounted for. (5) Improper operation and leaks in operation from loss of time or loss of materials should be indicated. (6) Comparative costs should be obtainable for different conditions of the same business at different times. (7) Intelligent comparisons can be made between companies or between mines using the same cost system. (8) Such records if suitably kept are really a diary of progress and at any time should show the exact financial condition of the business. The advantages of a system that will give the foregoing results seem self-evident, but the inertia of established customs must be overcome, and many well-established prejudices combated before detailed cost accounting can become

general. Cost sheets are too often considered as merely clerical details that any poorly paid clerk is competent to prepare. Cost statements are still very largely kept secret and are not subject to the criticism of others than those directly interested in their preparation.

A common reason for inaccurate and inadequate cost keeping is the method of developing a cost system too commonly used. An official of a company hears of the cost-keeping methods of another concern in the same business as his own, or, may be, in another business, and sends his chief bookkeeper to study the system. Stock forms from the other business are obtained and a similar system grafted on a business to which it is not applicable. The bookkeeper is often not in touch with the operating man and much useless information may be asked for and an undue amount of clerical work required of men to whom such work is distasteful.

The time of the mine bookkeeper is of much less value to the company than that of the superintendent, foreman and many other operating employees; hence the cost-accounting system and blanks used should be devised so as to require a minimum of trouble and time on the part of the operating man, rather than to attempt to accommodate the time of the bookkeeper. The farther the accounting office is away from the mine the more necessity is there for coördination between the accounting and operating officials. Presumably, the mine bookkeeper has considerable familiarity with the mine conditions, but the accountants in the Chicago or the St. Louis office, while very expert bookkeepers, may know very little of the mine conditions; hence any system they devise is apt to be unduly difficult of application at the mine, and if imposed on the mine management will not only be antagonized, but if insisted on, the data furnished are apt to be mainly guesswork and not actual operating figures.

In other cases expert accountants are employed, and while their systems may be better than those of less experienced bookkeepers, such accountants are too often unfamiliar with the local methods of operation, and their systems therefore may not be based upon local operating conditions. Any system of cost keeping to be successful and reliable must be worked out by proper coöperation between the operating and accounting departments, keeping strictly in mind that cost accounting and book-keeping are two essentially different functions; this dif-

ference may be small, but the distinction must be kept in mind.

During the past decade many books and articles have been written on cost accounting, scientific management and efficiency in shop management, in connection with manufacturing enterprises, but few books and comparatively few articles have yet appeared on mine cost accounting. Very recently, however, the subject has received a large amount of attention from associations of coal companies, such as the Franklin County Coal Operators Association, the Williamson County Coal Operators Association, the Saline County Coal Operators Association and the Central Illinois Coal Bureau in Illinois; the Splint Gas and Coal Association of West Virginia, the Southern Ohio Coal Exchange, the Pittsburgh Vein Operators Association of Ohio, the Harlan County Coal Operators Association in Kentucky and undoubtedly many others.

WHAT ARE UNIFORM COSTS?

Many who will agree that accurate cost accounting is essential to the greatest business success may be skeptical as to the possibility and practicability of uniform accounts for companies operating in different localities and under widely differing conditions. From the standpoint of a general statistician wishing to compare figures for different localities, standardization and uniformity are not only highly desirable, but essential, if general conclusions are to be reached that may be universally interpreted. That greatly different conditions can be accommodated by a standardized system is shown by the results accomplished in railroad accounting by the Interstate Commerce Commission.

The objection to "uniform accounts" is frequently due to a misunderstanding of the term, for a distinction should be made between uniform accounts and identical accounts. Two mining companies may use a standard or uniform system, but still may vary considerably* in the details of the uniform system in order to conform to their local conditions. Our interpretation of uniform accounts is a system in which the main or major headings or subdivisions are the same and where the same general principles are used in arriving at the several items and particularly in determining certain fundamental features. It is not necessary, however, in order to satisfy the conditions of practical uniformity to have identical items throughout.

ACCOUNTS SHOULD BE CAREFULLY ITEMIZED

It may be impracticable and unduly expensive for a small company to itemize its accounts to the same degree of detail that a large company may find it desirable and profitable to do, but it is essential for uniformity that under each general head shall be included exactly the same items of expense whether these items are carried on the books as separate accounts or not. For instance, if two companies carry ventilation accounts, the first (A) may subdivide this under such heads as: Fan, stoppings, overcasts, doors and regulators, trappers, repairs to stoppings, overcasts, doors, etc., maintenance of airways, temporary work, proportion of power, or such other as may suggest themselves.

Another company (B) may carry only the general heading "Ventilation." For the purpose of comparing the ventilation costs such difference in detailed classifi-

cation is immaterial provided B includes under its general heading of ventilation the same items as A, even though B may not keep a separate account for each of the items. If, however, B builds a concrete stopping and charges it under some such account as concrete construction and does not include it under ventilation, its ventilation costs are worthless for comparison with the ventilation costs of A.

The extent to which uniform subdivisions must be carried is a question open to much debate, but in attempting to establish a uniform system it is wise at first to keep the uniform headings at a minimum and to leave the detailed subclassifications as flexible as possible, being careful, however, to be sure that the general headings are understood to include as subheads items that are identical.

It should be comparatively easy to get the different members of any given mining association and also of a number of different associations to agree to a simple uniform system with comparatively few general heads, while any elaborate and greatly subdivided system would meet with widespread opposition. If a simple system is once adopted, the advantages of uniformity in the few general heads will soon be so apparent that further uniform subdivision will almost automatically follow. It is impossible and unwise often to attempt the ideal upon the first installation of so radical a change as uniform cost accounts and the ideal must be striven for and approached progressively and gradually.

A Waterway Coal Yard

BY J. C. TAYLOR
Louisville, Ky.

Waterway transportation leads naturally to the development of two desirable factors in connection with coal dealing. One of these is the introduction of labor-saving equipment and the other the bringing in of sand and gravel as a side line.

The writer made a survey of the river yard of the E. T. Slider Co., of Louisville, with the idea of obtaining some specific data on this point. This yard is on the banks of the Ohio River at the foot of Campbell St., in Louisville, and has a capacity for almost any amount of coal and also provision for large quantities of sand. The heavy sand stocking is generally done in the early spring and the heavy coal stocking in the late summer and fall, when the sand is being cleaned out.

A coal-handling float and hopper at the foot of an incline with buckets carrying from $1\frac{1}{2}$ to $2\frac{1}{2}$ yd. takes the coal out of the barges and dumps it into a hopper, from which it is dumped into coal trucks that operate on elevated ways.

At the top of the incline are storage bins that hold about 250 tons, and these can be utilized to save a lot of handling of coal from piles into wagons, as the wagons are driven under the chutes at each side of the storage house and are readily loaded without all the hand labor incident to shoveling and forking from piles.

The company operates a large sand digger in the river above Louisville, and the sand and gravel business dovetails nicely with the concern's extensive coal business. It is the combination of the two, with the developments in the mechanical handling devices, that seems of importance in connection with waterside yards.

Location and Construction of Mine Tracks—VII

BY J. McCRYSTLE

Minersville, Penn.

SYNOPSIS—This article deals with track turnouts. Switch designs should, so far as possible, be standardized and such standardized design rigidly adhered to. The lead of turnout off curves are for all practical purposes of the same length as those off straight track.

THE assumption that a turnout is a simple curve from the point of switch to the point of frog is no longer tenable. By the simple curve theory, the lead was found by multiplying twice the gage by the number of the frog; the radius of the curve by multiplying twice the gage by the square of the number. The above, of course, ignores the fact that the frog

is straight and not curved, and the switch points are, especially for mine work, also straight.

In standardizing the switch design, the frog numbers to be used and the length of switch point to accompany each frog should first be determined. The design of each frog and switch proposed should be gone into thoroughly and the types adopted rigidly adhered to. Local conditions will determine the frog angles and switch points most suitable.

Companies purchasing their equipment from manufacturers will find it advisable to state the frogs and switches they propose to use and have the builders of such equipment furnish designs of the entire turnout. For the convenience of the companies who make their own frogs and switches, the following formulas are given. Referring to Fig. 20:

TABLE 1. DIMENSIONS OF FROGS FOR DIFFERENT WEIGHT OF RAILS

24-In. Gage

Frog No.	Frog Angle F	Bluntness D	Wing Rail B	Switch Length S	Switch Angle φ	Chord C	Lead L	Radius R	Middle Ordinate M	Heel Distance H	F — φ Angle
	Deg. Min.	In.	Ft. In.	In.	Deg. Min. Sec.	Ft.	In.	Ft. In.	In.	Ft. In.	Deg. Min.
1 ¹ ₄	31 53	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	3 4	9 0 ¹ ₂	6 0 ¹ ₂	2 ¹ ₂	3 4 ¹ ₂	27 21
2	28 04	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	3 11 ¹ ₂	9 8 ¹ ₂	8 7 ¹ ₂	2 ¹ ₂	3 11 ¹ ₂	23 32
2 ¹ ₂	22 38	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	3 15 ¹ ₂	10 10 ¹ ₂	15 2 ¹ ₂	2 ¹ ₂	5 1 ¹ ₂	18 06
3	18 55	7 ¹ ₆	1 3	5	4 32 12	5 10 ¹ ₂	11 11 ¹ ₂	22 6 ¹ ₂	2 ¹ ₂	5 11 ¹ ₂	14 23
3 ¹ ₂	16 16	7 ¹ ₆	1 3	5	4 32 12	6 11 ¹ ₂	13 0 ¹ ₂	32 11 ¹ ₂	2 ¹ ₂	6 11 ¹ ₂	11 44
4	14 15	1	1 5	5	4 32 12	7 8 ¹ ₂	15 11 ¹ ₂	44 5 ¹ ₂	3 ¹ ₂	7 8 ¹ ₂	9 43
5	11 25	1 ¹ ₂	1 9 ¹ ₂	7 ¹ ₂	3 1 27	9 11 ¹ ₂	19 0 ¹ ₂	67 1 ¹ ₂	2 ¹ ₂	10 1 ¹ ₂	8 24
6	9 31	1 ¹ ₂	2 1 ¹ ₂	7 ¹ ₂	3 1 27	11 5 ¹ ₂	20 11 ¹ ₂	100 2 ¹ ₂	3 ¹ ₂	11 5 ¹ ₂	6 30

30-In. Gage

Frog No.	Frog Angle F	Bluntness D	Wing Rail B	Switch Length S	Switch Angle φ	Chord C	Lead L	Radius R	Middle Ordinate M	Heel Distance H	F — φ Angle
	Deg. Min.	In.	Ft. In.	In.	Deg. Min. Sec.	Ft.	In.	Ft. In.	In.	Ft. In.	Deg. Min.
1 ¹ ₄	31 53	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	4 11 ¹ ₂	10 6 ¹ ₂	9 2 ¹ ₂	3 ¹ ₂	4 11 ¹ ₂	27 21
2	28 04	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	5 8 ¹ ₂	11 4 ¹ ₂	12 9 ¹ ₂	3 ¹ ₂	5 9 ¹ ₂	23 32
2 ¹ ₂	22 38	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	7 2 ¹ ₂	12 11 ¹ ₂	21 8 ¹ ₂	3 ¹ ₂	7 2 ¹ ₂	18 06
3	18 55	7 ¹ ₆	1 3	5	4 32 12	8 4 ¹ ₂	14 6 ¹ ₂	32 11 ¹ ₂	3 ¹ ₂	8 4 ¹ ₂	14 23
3 ¹ ₂	16 16	7 ¹ ₆	1 3	5	4 32 12	9 8 ¹ ₂	15 46 ¹ ₂	46 3 ¹ ₂	3 ¹ ₂	9 8 ¹ ₂	11 44
4	14 15	1	1 5	7 ¹ ₂	3 1 27	11 8 ¹ ₂	20 4 ¹ ₂	58 6	3 ¹ ₂	11 8 ¹ ₂	11 14
5	11 25	1 ¹ ₂	1 9 ¹ ₂	7 ¹ ₂	3 1 27	13 11 ¹ ₂	23 0 ¹ ₂	94 0 ¹ ₂	3 ¹ ₂	13 11 ¹ ₂	8 24
6	9 31	1 ¹ ₂	2 1 ¹ ₂	10	2 16 07	17 0 ¹ ₂	29 0 ¹ ₂	133 9 ¹ ₂	3 ¹ ₂	17 1 ¹ ₂	7 15

36-In. Gage

Frog No.	Frog Angle F	Bluntness D	Wing Rail B	Switch Length S	Switch Angle φ	Chord C	Lead L	Radius R	Middle Ordinate M	Heel Distance H	F — φ Angle
	Deg. Min.	In.	Ft. In.	In.	Deg. Min. Sec.	Ft.	In.	Ft. In.	In.	Ft. In.	Deg. Min.
1 ¹ ₄	31 53	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	6 6 ¹ ₂	12 1	12 3 ¹ ₂	4 ¹ ₂	6 7 ¹ ₂	27 21
2	28 04	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	7 5 ¹ ₂	13 1 ¹ ₂	16 10 ¹ ₂	4 ¹ ₂	7 6 ¹ ₂	23 32
2 ¹ ₂	22 38	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	9 4 ¹ ₂	15 0 ¹ ₂	28 4 ¹ ₂	4 ¹ ₂	9 4 ¹ ₂	18 06
3	18 55	7 ¹ ₆	1 3	5	4 32 12	10 9 ¹ ₂	16 8 ¹ ₂	41 8 ¹ ₂	4 ¹ ₂	10 10 ¹ ₂	14 23
3 ¹ ₂	16 16	7 ¹ ₆	1 3	5	4 32 12	12 5 ¹ ₂	18 5 ¹ ₂	59 7	5 ¹ ₂	12 6 ¹ ₂	11 44
4	14 15	1	1 5	7 ¹ ₂	3 1 27	15 0 ¹ ₂	23 8 ¹ ₂	75 3 ¹ ₂	4 ¹ ₂	15 0 ¹ ₂	11 14
5	11 25	1 ¹ ₂	1 9 ¹ ₂	10	2 16 07	18 11 ¹ ₂	30 5 ¹ ₂	117 1 ¹ ₂	4 ¹ ₂	18 11 ¹ ₂	9 09
6	9 31	1 ¹ ₂	2 1 ¹ ₂	10	2 16 07	21 11 ¹ ₂	33 10 ¹ ₂	172 1 ¹ ₂	4 ¹ ₂	21 11 ¹ ₂	7 15

42-In. Gage

Frog No.	Frog Angle F	Bluntness D	Wing Rail B	Switch Length S	Switch Angle φ	Chord C	Lead L	Radius R	Middle Ordinate M	Heel Distance H	F — φ Angle
	Deg. Min.	In.	Ft. In.	In.	Deg. Min. Sec.	Ft.	In.	Ft. In.	In.	Ft. In.	Deg. Min.
1 ¹ ₄	31 53	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	8 1 ¹ ₂	13 7 ¹ ₂	15 5 ¹ ₂	5 ¹ ₂	8 2	27 21
2	28 04	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	9 3 ¹ ₂	14 0 ¹ ₂	21 0	5 ¹ ₂	9 4 ¹ ₂	23 32
2 ¹ ₂	22 38	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	11 5 ¹ ₂	17 1 ¹ ₂	34 8 ¹ ₂	5 ¹ ₂	11 6 ¹ ₂	18 06
3	18 55	7 ¹ ₆	1 3	5	4 32 12	14 2 ¹ ₂	22 3 ¹ ₂	49 6 ¹ ₂	5 ¹ ₂	12 2 ¹ ₂	15 54
3 ¹ ₂	16 16	7 ¹ ₆	1 3	5	4 32 12	16 5 ¹ ₂	24 9 ¹ ₂	69 6 ¹ ₂	5 ¹ ₂	16 5 ¹ ₂	13 15
4	14 15	1	1 5	7 ¹ ₂	3 1 27	18 4 ¹ ₂	26 11 ¹ ₂	92 0 ¹ ₂	5 ¹ ₂	18 4 ¹ ₂	11 14
5	11 25	1 ¹ ₂	1 9 ¹ ₂	10	2 16 07	23 1 ¹ ₂	34 7 ¹ ₂	143 1 ¹ ₂	5 ¹ ₂	23 1 ¹ ₂	9 09
6	9 31	1 ¹ ₂	2 1 ¹ ₂	10	2 16 07	31 8 ¹ ₂	38 6 ¹ ₂	210 4 ¹ ₂	5 ¹ ₂	26 10 ¹ ₂	7 15

48-In. Gage

Frog No.	Frog Angle F	Bluntness D	Wing Rail B	Switch Length S	Switch Angle φ	Chord C	Lead L	Radius R	Middle Ordinate M	Heel Distance H	F — φ Angle
	Deg. Min.	In.	Ft. In.	In.	Deg. Min. Sec.	Ft.	In.	Ft. In.	In.	Ft. In.	Deg. Min.
1 ¹ ₄	31 53	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	9 8 ¹ ₂	15 1 ¹ ₂	18 7 ¹ ₂	7	9 10	27 21
2	28 04	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	11 0 ¹ ₂	16 6 ¹ ₂	25 1 ¹ ₂	6 ¹ ₂	11 1 ¹ ₂	23 32
2 ¹ ₂	22 38	7 ¹ ₆	1 0 ¹ ₂	5	4 32 12	13 7 ¹ ₂	19 2 ¹ ₂	41 3	6 ¹ ₂	13 1 ¹ ₂	18 06
3	18 55	7 ¹ ₆	1 3	5	4 32 12	15 9 ¹ ₂	25 1 ¹ ₂	58 9	7	16 10 ¹ ₂	15 54
3 ¹ ₂	16 16	7 ¹ ₆	1 3	5	4 32 12	17 9 ¹ ₂	82 2 ¹ ₂	108 9 ¹ ₂	6 ¹ ₂	21 8 ¹ ₂	13 15
4	14 15	1	1 5	7 ¹ ₂	3 1 27	21 8 ¹ ₂	3				

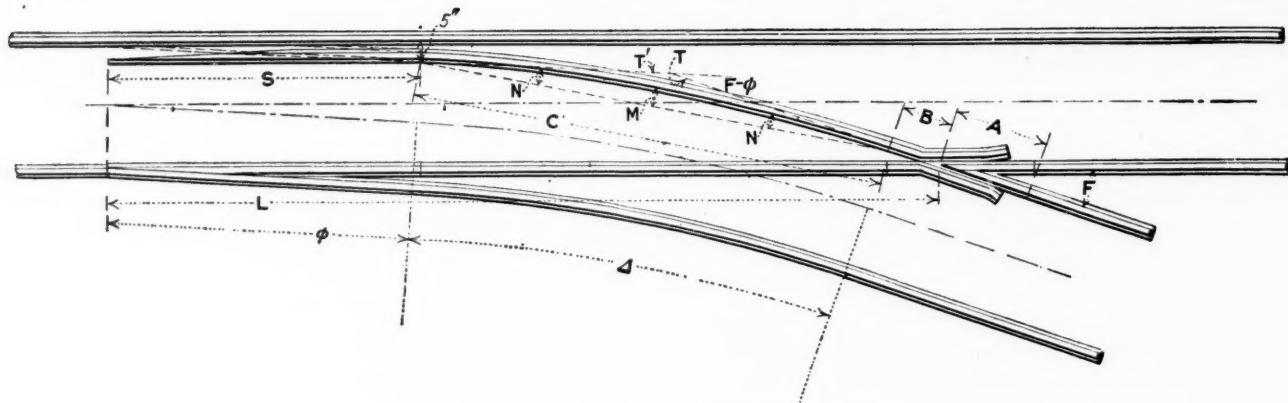


FIG. 20. PLAN OF TYPICAL TURNOUT LAYOUT

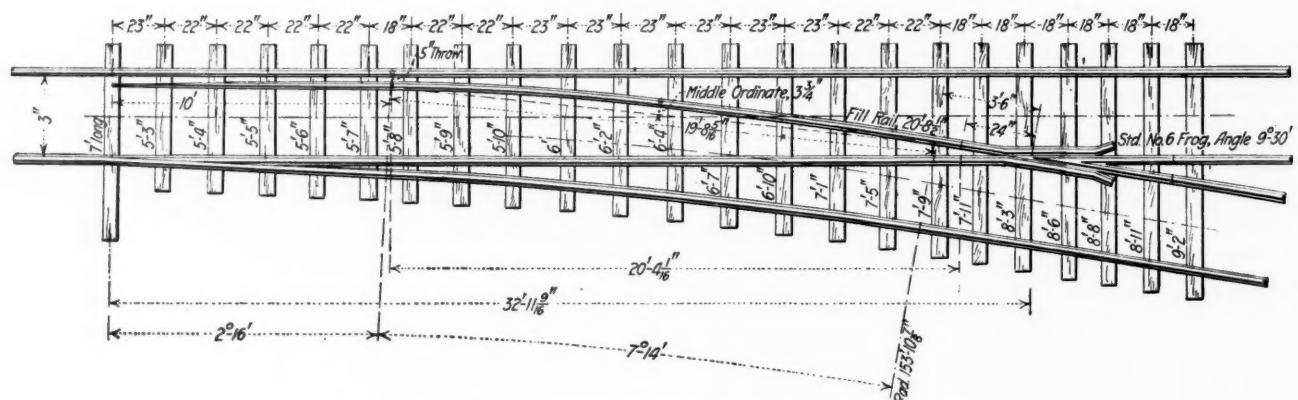


FIG. 21. STANDARD TURNOUT FOR MAIN-HAULAGE ROADS

Let

- ϕ = Angle of switch points;
- F = Angle of frog;
- G = Gage of track;
- B = Length of wing rail;
- C = Chord of switch rail arc;
- S = Length of switch rail;
- L = Length of lead;
- R = Radius of center line of turnout curve;
- H = Heel distance;
- D = Distance from theoretical to actual frog point.

Then

$$C = \frac{G - B \sin F - S \sin \phi}{\sin \frac{1}{2}(F + \phi)}$$

$$R = \frac{C}{2 \sin \frac{1}{2}(F - \phi)} - \frac{1}{2}G$$

Or

$$R = \frac{G - B \sin F - H}{\cos \phi - \cos F} - \frac{1}{2}G$$

$L = (R + \frac{1}{2}G) (\sin F - \phi) + B \cos F + S + DC$.
Table I has been worked from the foregoing formulas—the actual shape and size of the frog and switch are used—a simple curve connecting the heel of the switch with the end of the frog.

The dimensions in the table, of course, are only applicable to turnouts having the same switch lengths and the same wing rails used in the table. As stated before, to a certain extent the frogs made from different weights of rail can be made the same dimensions, so that one turnout design for any frog of a given num-

ber will be sufficient. Similar tables should be furnished the trackman for the various turnouts to be installed.

Some trackmen, instead of using the actual length of the frog from the point to the end of the wing rail (B in the formula), prefer to have a tangent from the point of the frog for a distance not less than a few inches greater than the wheelbase of the mine cars used. This is done in order that both wheels of the car may be traveling in a straight line before the point is reached; and if this is desired, B in the formula should be made equal to this distance. Naturally, where the length of the wing rail is greater than the wheelbase, the length of the wing rail should be used.

To determine the angle of the switch points or latches, the heel distance (H), which should be 4 to 5 in., is divided by the length of the points; the result is the sine of the switch angle. The less the angle the less the shock to the motion of the cars, and consequently the greater speed and safety with which the rolling stock will travel over the switch.

There are locations, however, where the amount of room is limited, and shorter frogs or switch points, or both, must be resorted to; and the extreme to which this can be carried will be governed by the radius R of the lead curve, combined with practical experience.

When the frog and switch standardization has been decided upon, and the designs for the complete turnouts have been made, the various parts of the turnout, including the frogs, switches, points, the middle rail curved to the proper radius and drilled, and all the other parts, should be carried in stock, so that

when it is desired to install a turnout, all that will be necessary is to specify the frog number desired and the entire equipment can be delivered to the site desired and will require a minimum of labor to install it. The ties for the turnout should be in graded lengths to

radius of the lead curve of the turnout can also be taken from the table.

The minimum radius, which has been adopted for curves, can likewise be taken in terms of degree of curve from the table.

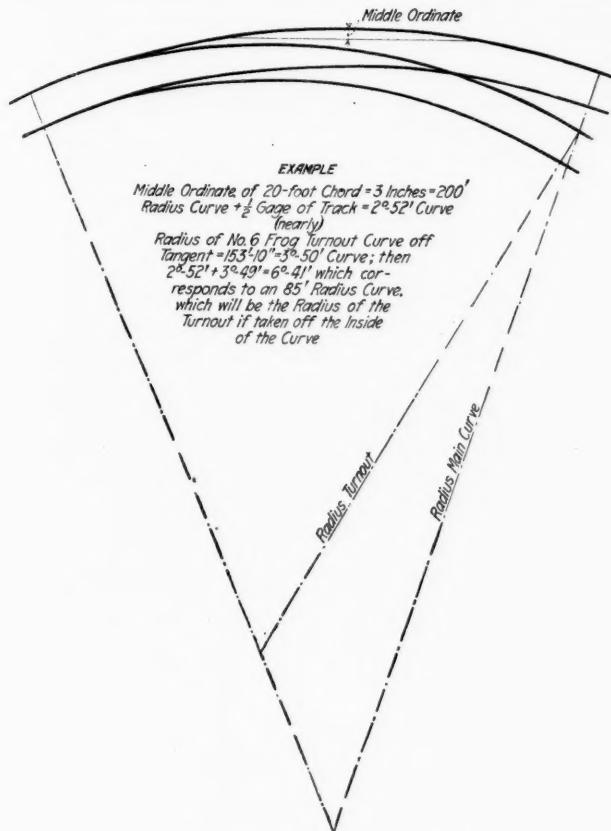


FIG. 22. TURNOUT OFF A CURVE

carry both the main and turnout curve as far as the end of the frog. Such ties would be delivered with the rest of the turnout equipment.

It is obvious that by having this equipment standard, and thereby interchangeable, great economy can be achieved in both the original installation and renewals.

TURNOUTS OFF CURVES

For all practical purposes, the lead of a turnout off a curve, whether from the inside or outside of the curve, is the same as the lead off a straight track. The radius of the curve connecting the frog and switch points, however, will increase or decrease, depending on whether the turnout is to the outside or the inside of the main curve.

Table 2, which is based on the assumption that the degree of curve is the angle subtending a 10-ft. chord, is but a modification decimal of the standard practice for expressing the degree of curvature, and is more fully discussed under "Alignment on the Surface."

The degree of the main curve may be found by stretching a tape or string along one of the rails and then measuring the middle ordinate. From this middle ordinate, the degree of curve can be taken by referring to the table; the degree of curve corresponding to the

TABLE 2. RADII, DEGREES OF CURVE AND ORDINATES BASED ON A 10-FT. CHORD

Radius, Ft.	Degree of Curve		Middle Ordinate of 10-Ft. Chord, Ft. In.	Radius, Ft.	Degree of Curve		Middle Ordinate of 10-Ft. Chord, Ft. In.
	Deg.	Min.			Deg.	Min.	
15	39	000	3 9 $\frac{1}{2}$	18	22	20	3 0 $\frac{1}{2}$
20	29	00	2 8 $\frac{1}{2}$	22	26	20	2 4 $\frac{1}{2}$
24	24	00	2 2 $\frac{1}{2}$	26	22	10	2 0
28	20	30	1 10 $\frac{1}{2}$	30	19	12	1 8 $\frac{1}{2}$
32	17	58	1 7 $\frac{1}{2}$	34	16	54	1 6
36	15	58	1 5	38	15	08	1 3
40	14	22	1 3	42	13	40	1 2 $\frac{1}{2}$
44	13	2	1 1 $\frac{1}{2}$	46	12	28	1 1 $\frac{1}{2}$
48	11	58	1 50	50	11	28	1 0
52	11	2	0 11 $\frac{1}{2}$	54	10	38	0 11 $\frac{1}{2}$
56	10	14	0 10 $\frac{1}{2}$	58	9	53	0 10 $\frac{1}{2}$
60	9	34	0 10	62	9	15	0 9 $\frac{1}{2}$
64	8	58	0 9 $\frac{1}{2}$	66	8	41	0 9 $\frac{1}{2}$
68	8	26	0 8 $\frac{1}{2}$	70	8	12	0 8 $\frac{1}{2}$
72	7	58	0 8 $\frac{1}{2}$	74	7	45	0 8 $\frac{1}{2}$
76	7	33	0 7 $\frac{1}{2}$	78	7	21	0 7 $\frac{1}{2}$
80	7	10	0 7 $\frac{1}{2}$	85	6	45	0 7
90	6	22	0 6 $\frac{1}{2}$	92	6	14	0 6 $\frac{1}{2}$
95	6	2	0 6 $\frac{1}{2}$	100	5	44	0 6
105	5	28	0 5 $\frac{1}{2}$	110	5	13	0 5 $\frac{1}{2}$
115	4	59	0 5 $\frac{1}{2}$	120	4	47	0 5
130	4	25	0 4 $\frac{1}{2}$	140	4	6	0 4 $\frac{1}{2}$
150	3	49	0 4	160	3	35	0 3 $\frac{1}{2}$
170	3	22	0 3 $\frac{1}{2}$	180	3	11	0 3 $\frac{1}{2}$
190	3	1	0 3 $\frac{1}{2}$	200	2	52	0 3

$$\text{Radius} = \frac{5.0}{\sin \frac{1}{2} \text{ deg. of curve}}$$

$$\text{Degree of curve} = \frac{573}{\text{radius}} \text{ (approximate)}$$

Ordinates midway between middle ordinate and end of chord equal three-quarters of the middle ordinate.

If the turnout is to lead off the inside of a curve, the degrees of curve of both the main track and the proposed turnout, as computed for turning off a tangent, are added. If this does not exceed the degree of curve of the minimum radius allowed, the frog and turnout in question may be installed. Should the degree of curve exceed that corresponding to the allowable radius, it will be necessary to repeat the process with longer frogs until the combined degrees of curve fall within the limit.

If the turnout leads off the outside of the main curve, the degree of curve of both the main track and turnout track (as computed for on a tangent) is found similarly, the degree of turnout curve being subtracted from the degree of curve of the main track; the result will be the degree of curve corresponding, which can be found in terms of the radius by referring to the table. When this has been determined, the

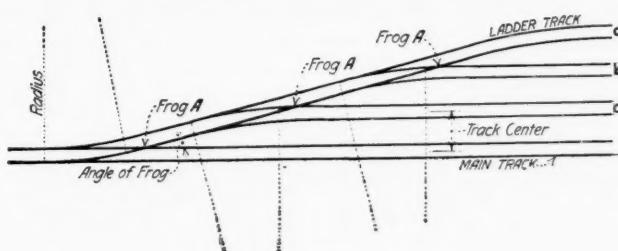


FIG. 23. LADDER TRACKS

advisability of using a shorter frog can be considered. In every case, however, whether the turnout be off the straight or the inside or outside of a curve, the lead corresponding to a certain frog and switch points should be the same.

(To be continued)

Interesting Electric System of Haulage at a Coal Mine—II

BY FRANK HOSKINSON

Chief Electrician, Victor-American Fuel Co., Delagua, Colo.

SYNOPSIS—This installment takes up the details of hoist and locomotive control. The adoption of a dual system of operation has resulted in many economies, chief among which is greater freedom from burnouts and charred insulation.

THE hoist equipment at the Victor-American Fuel Co., at Delagua, Colo., consists of two 150-hp. 250-volt, direct-current motors, operated by a General Electric Type M control and a C-34 controller. This control has 8 points. On the first five the motors are in series; on the sixth point the motors are in multiple with the resistance cut in; on the eighth point the motors are in multiple with all resistance cut out.

The operation of the control on the old system was as follows: First step, with contactors 4, 7 and 10 closed, all resistance is cut in and the motors are in series on 250 volts. Second step, contactors 2, 4, 7 and 10 are closed. This cuts out two sets of resistance. Third step, contactors 2, 4, 7, 8 and 10 closed cuts out two more sets of resistance. Fourth step, contactors 1, 2, 4, 6, 7, 8 and 10 closed cuts out two more sets of resistance. Fifth step, contactors 1, 2, 4, 5, 6, 7, 8 and 10 closed cuts out one more set of resistance; the motors are now in series across the line. Sixth step, when contactors 3, 4, 9 and 10 close, contactors 1, 2, 5, 6, 7 and 8 open and the motors are in multiple, No. 1 motor with two sets of resistance cut in, No. 2 motor with three sets of resistance cut in. Seventh step, closing contactors 1, 3, 4, 6, 8, 9 and 10 cuts out one set of resistance on No. 1 motor and one set on No. 2 motor. Eighth step, contactors 1, 2, 3, 4, 5, 6, 8, 9

In Fig. 1 is shown all connections of the hoist on the old system. Fig. 2 shows all connections of the hoist on the new system. Fig. 4, panel 1H, shows all the switches that were in use on the old system. Fig. 4, panel 2H, shows the extra panel and switches. I

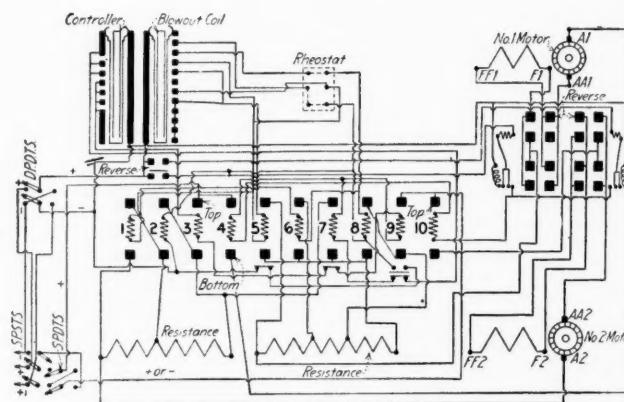


FIG. 2. CONNECTIONS OF HOIST ON NEW SYSTEM

arranged these so as to be able to cut out either one of the motors and leave the other in operation, in case of an accident to one of them. This arrangement will allow operation with one motor.

In Fig. 3 is shown the new panel and all switches that were added to the hoist for changing its operation to either the new or the old system of operation. The pilot lights indicate the kind of voltage that is on the lines so that the hoist man can set his switches properly. All four lamps burning indicates that the potential is 500 volts, new system, but if only two lamps are burning and these are the green ones, it will indicate that the voltage is only 250 volts, old system.

MORE RESISTANCE ADDED IN NEW SYSTEM

The position of the switches for the new system is given in Fig. 3. For operation on the old system, it is only necessary to put in the negative switch and change the switch marked A from the up position to the down position. This will allow the hoist to operate on the old system of 250 volts, and it will not make any difference as to how the substation is operating, whether new or old system.

In the new system of operation on 500 volts we have added five more sets of resistance, making a total of 12 sets. We have also arranged a stop on the controller so as not to let it go any further than the fifth step.

The operation of the control on the new system is as follows: First step, with contactors 4, 7 and 10 closed, all resistance is cut in and the motors are in series on 500 volts. Second step, contactors 2, 4, 7 and 10 closed cut out two sets of resistance. Third step, when contactors 2, 4, 7, 8 and 10 close it cuts out three more sets of resistance. Fourth step, contactors 1, 2, 4, 6,

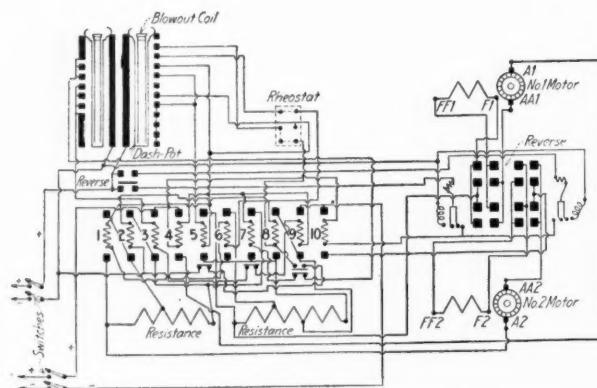


FIG. 1. CONNECTIONS OF HOIST ON OLD SYSTEM

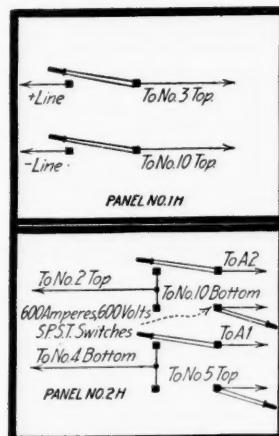
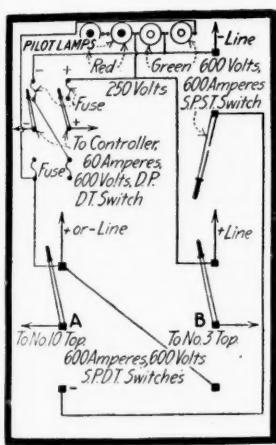
and 10 closed cuts out all of the resistance, and the motors are in multiple across the line.

In the old system the hoist used so much power that it was necessary to cut out some of the mine locomotives in order to allow the hoist enough power to operate.

7, 8 and 10 closed cuts out four more sets of resistance. Fifth step, contactors 1, 2, 4, 5, 6, 7, 8 and 10 closed cuts out three more sets of resistance. The motors are now in series across the line on a voltage of 500. This allows each motor to get its rated potential of 250 volts. The controller is blocked at the fifth point so as not to go any further.

In the operation of the hoist on the new system of 500 volts we have much more power and a little higher speed than was obtainable on the old system. We have never had to cut out the mine locomotives in order to get power enough to operate the hoist on the new system, as there is power enough to operate on peak loads and the substation will supply the demands either for a small amount of power or for a heavy overload and will not have to be regulated. This is a decided advantage over the old system, as with that system it was necessary constantly to regulate the voltage of the machines for every change in the direct-current load as well as for every change in the alternating-current input, whether it was a variation in the voltage or in the frequency.

The main advantage in the new system is that it makes little difference to the operation of the substation



FIGS. 3 AND 4. SHOWING THE SWITCHES IN USE ON BOTH OLD AND NEW SYSTEMS

in series as to whether the voltage is high, normal or low. The machines will operate without any attention and at the same time seem to boost each other; also, the machines at the substation will not heat up nearly as much as they did on the old system. This same statement applies to all of the electric mine locomotives in service at the mines.

The troubles resulting from the armatures, field coils and resistance heating up and charring the insulation to such an extent that they needed rewinding have been carefully done away with. This will mean quite a saving in the item of repairs alone. At the same time the speed of the mine locomotives has been increased, thereby increasing the output of the mines and decreasing the maintenance expense, even though using the same equipment.

With the operation of the substation on the old system of multiple control on the direct-current side, it was impossible to keep the machines together on a low voltage or on a low frequency. The reason for this has already been explained.

Anthracite in 1916

The anthracite mined in 1916 amounted to 78,195,083 gross tons, valued at \$202,009,561, a decrease in quantity of 1.6 per cent. and an increase in value of 9.4 per cent. compared with 1915. The shipments decreased 1.7 per cent.—from 68,666,456 gross tons in 1915 to 67,501,363 tons in 1916. The shipments of prepared coal of sizes above pea in 1916 were 40,747,215 tons, a decrease of 1.1 per cent.; the shipments of pea size were 7,520,804 tons, a decrease of 8.4 per cent.; and the shipments of steam sizes smaller than pea were 19,233,344 tons, a decrease of but 0.05 per cent. when compared with the year 1915.

There was also an increase of nearly 6 per cent. in the quantity of anthracite sold locally and used by employees and a decrease of 2.4 per cent. in the quantity used for mine fuel. The compilation of these statistics has recently been completed by C. E. Lesher, of the United States Geological Survey, Department of the Interior.

The effect of the extraordinary demand for steam sizes of anthracite that followed the industrial activity in 1916 and the high price of bituminous coal is indicated in the figures showing the output of washery product and dredge coal. Although the freshly mined coal in the anthracite region, including Sullivan County, showed a decrease of 2.6 per cent. in 1916 compared with 1915, there was an increase of 19.6 per cent. in the quantity of anthracite obtained from the washeries, which operate mainly on old culm banks, and an increase of 16 per cent. in the quantity of coal dredged from rivers.

The production in the Lehigh regions was 10,929,055 gross tons; in the Schuylkill region, 23,659,448 tons; in the Wyoming region, 43,111,732 tons; and in Sullivan County (Bernice Basin), 494,848 tons.

There was a large decrease in the number of men employed in the production of anthracite in 1916, and the output was maintained only through an increase in the number of working days. The number of men employed in 1914 was 179,679; in 1915, 176,552; and in 1916, 159,869. The average number of days worked was 245 in 1914, 230 in 1915, and 253 in 1916. The average output per man per day in 1914 was 1.84 gross tons; in 1915, 1.96 tons, and in 1916, 1.93 tons. The average output per employee for the year was 451 tons in 1914; 450 tons in 1915; and 489 tons in 1916.

Oil and Ammonia in Cannel Slates

Experiments have shown that as much as 45 gal. of oil and 3.72 lb. of ammonia could be extracted from a short ton of a certain cannel slate, a foot thick, found 15 in. above the lower Freeport coal in Clay Township, Butler County. A sample from the dump of an old mine near Queen Junction of the same county, probably a low-grade cannel coal, gave oil at the rate of 43 gal. per short ton. The ammonia content in the same quantity of coal was 4.99 lb. Another sample of shale or cannel coal from a weathered outcrop gave oil at the rate of only 24 gal. per short ton, but ammonia equivalent to 9.43 lb. for the same unit quantity.—Extracted from bulletin of George H. Ashley on "Oil Resources of Black Shales of the Eastern United States."

The Power Situation at Coal Mines

BY C. M. MEANS
Pittsburgh, Penn.

SYNOPSIS—*The power companies, particularly those operating in the bituminous fields, tried for a long time to stir up a little ripple in the coal industry, without much encouragement. They are now, however, engulfed by a tidal wave in the shape of demands for power that they cannot meet.*

ALL lines of industry in which profits are materially increased have expanded rapidly in the last few years, regardless of the ownership of the industry. Millions of farmers have increased their acreage to meet the demand for crops; steel manufacturers have readily sold their products and extended their factories. Coal operators have endeavored to supply the demands by turning a liberal share of the increased profits back into the mines in the way of improvements; and power companies have expanded greatly as regards new consumers. But are these latter firms sincerely responding in the matter of bettering the service, or are they keeping pace with production by adding new generating equipment or, in other ways, correspondingly increasing the capacity of their systems?

POWER QUESTION ONE OF INCREASING IMPORTANCE

The power question, relative to the cost of coal production, has been a comparatively small item, although an essential one, and for this reason the coal producer was content to supply his requirements from a small, more or less obsolete power plant with hardly a thought regarding the cost of energy; but, with the increasing demand an entirely new difficulty became apparent. New mining equipment would have to be installed, with a consequent demand for more power; the existing power plant was inadequate and additional power equipment expensive, practically unavailable within a reasonable length of time, and furthermore, any increase in capacity would, in most cases, seem unreasonable unless the whole plant was remodeled. These limitations appeared at best to be inevitable barriers to any attempt to meet the coal demand. And then almost at the point of utmost discouragement the central station companies seemingly came to the rescue.

A power solicitor, armed with numerous methods of deductive calculations and legally worded power contracts, proved that by the use of all electrical mining equipment, and by purchasing power, the energy costs could be cut to a low figure, and furthermore, new equipment could be added at any time with no thought or worry of the power supply. In addition to this, the coal producer would be relieved from all of the troubles due to bad boiler water, constant maintenance of power plants, the difficulty of getting competent engineers, mechanics and firemen, and numerous other unfavorable features incidental to small plants.

The power contracts themselves may have involved comprehensive difficulties on the part of the coal man, and the solicitor himself may have been at a disadvan-

tage in interpreting them, but we will assume that the many "discounts" appeared highly enticing, and any other points which lacked clearness were taken for granted with the exception of the "readiness-to-serve" charge. The solicitor was, no doubt, well fortified for an argument on this point, and thereby proceeded to explain that in view of the fact that the power company had to provide and maintain extra capacity in apparatus for the purpose of supplying a sudden extra demand for power on the part of the consumer, the company, for this service, was entitled to a small additional fee when such load peaks were drawn.

The coal producer may have accepted such an explanation on its merit and admitted the justice of this charge, but he no doubt hoped that his merchant would not adopt a similar plan and ask more per pound for 25 lb. of a certain staple than he did for 5 lb., simply because the space required, and the investment represented, by the large quantity caused him an added burden.

However, no matter how tactfully or otherwise the central station's representative may have presented his case, he certainly had sufficient truth and advantage in his favor so that if he presented only half the facts the coal man was thoroughly convinced that a most remarkable saving could be effected by discarding his plant and purchasing power. Nor were these results in the least exaggerated, for in the majority of cases nothing but complete satisfaction accompanied the introduction of purchased power. All of this has resulted in many coal producers going through the same process, until now several large networks of central-station systems have been built up.

INTERRUPTIONS IN POWER SERVICE FREQUENT

But now, from the very face of an admirable victory over past discouragements, a new condition which threatens the undoing of our recent meritorious achievements is arising. This condition threatens even more than the undoing, it portends a state of affairs even worse than the conditions characteristic of the discarded isolated power plant. The coal operator finds that the interruptions in power service are becoming more and more frequent. He finds that in spite of the fact that he is paying a "readiness-to-serve" charge, the power company is seldom "ready to serve." He finds that the supply voltage frequently varies to such extremes that the Tirrill regulator is completely at a loss as to what to do next. He finds also many other most irritating difficulties which had not appeared before and which hardly seem feasible to credit to German spies.

The credit system of handling money is extremely convenient, and within certain limits elastic, but when additional credit is secured without a corresponding increase in securities, there is grave danger of some or all of the creditors suffering. Right here lies the unfortunate property of the central-station system—it is too convenient and elastic. Whenever an extension is made or a new consumer taken on without a corresponding addition in securities in the way of added capacity and protection, somebody is forced to suffer much, or every-

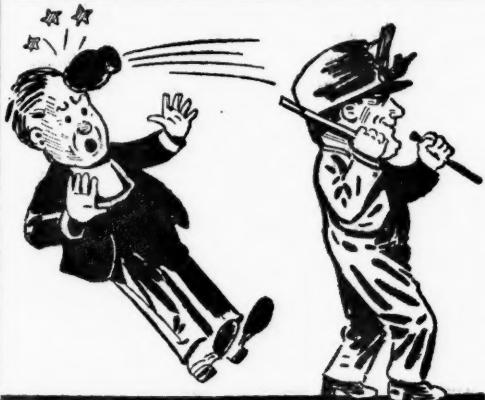
body a little, and if this expansion without additional protection and capacity is carried to the extreme—and present appearances indicate a strong tendency in that direction—then every consumer will suffer a lot.

Now it is not the purpose to criticize the central companies' methods, or suggest or even think that means of betterment could be accomplished with comparatively little effort; nor do I wish to convey the idea that these statements represent characteristics of all operating companies, but, on the other hand, I merely ask those companies who may be less conservative in the matter of good service, if some method cannot be devised to stay the present trend of overloaded systems, unprotected extensions and dissatisfied users.

The central power companies, in general, have done, and are doing, an extremely creditable amount of good in the way of simplifying the power question and lowering the cost of production; and it would seem a sad condition indeed, to permit this high degree of perfection to become overshadowed with the evils of poor service.

Exposition of Chemical Industries

The Third National Exposition of Chemical Industries, which will open on Sept. 24, in the Grand Central Palace, New York City, is expected to be the largest exposition of its kind ever held at any place in the world. It will occupy three floors of the Grand Central Palace and have about 350 exhibitors.



Off flies the hammer

Any old time that I pause momentarily
Near to a laborer drilling a hole,
Off flies the hammer and beans me summarily,
Knocking me stiff as a telegraph pole.
Shafting or gears never fail to entangle me,
Catching wherever my jumper is torn,
Twisting me round till they're likely to strangle me;
I'm the unluckiest guy ever born.

If I've a notion to be economical,
Saving the minutes by bouncing a trip,
I become subject to work anatomical—
Patching up cuts or resetting a hip;
Or, if I monkey with any machinery,
Something is sure to let loose and I'm struck,
Heaving me galley west into the scenery;
I am the champion guy for bad luck.

The Workman's Intoxication

By CHESLA C. SHERLOCK

The subject of intoxication has caused the courts no end of trouble. Cases are daily brought before the bench and bar which involve the question of whether intoxication affects the ordinary rights which a person would enjoy if he were sober.

If a workman is injured while under the influence of liquor, can he plead intoxication as a defense to his own negligence? The law is well settled that an intoxicated person is required to exercise ordinary care for his own safety. Indeed, he must use the same degree of care that would have been exercised by an ordinary prudent (sober) man under like circumstances.

One authority has held that "one cannot voluntarily place himself in a condition whereby he loses the control of his brain and muscles as a man of ordinary prudence and caution in the full possession of his faculties would exercise, and hold another, ignorant of his condition, liable for injuries to which such condition contributed."

Intoxication, in itself, will not operate to defeat a recovery. It is not of itself such a lapse of prudence as will amount to contributory negligence and defeat a recovery; nor is intoxication negligence *per se*. It is, however, a circumstance to be considered in determining contributory negligence. In other words, it is what is known at law as an evidentiary fact from which negligence may be inferred if the circumstances warrant it.

The Unlucky Man

By RUFUS T. STROHM

I have seen trophies in endless variety
Given for everything under the sun;
Even the four-footed pets of society
Numerous yards of blue ribbon have won;
Still, if some person well grounded financially
Offered rewards for unfortunate guys,
I'd be the fellow to profit substantially,
I'd gallop off with the capital prize.

If a bare wire lay quite unsuspiciously
Kinked in a snarl at the side of the track,
And with the thought I was acting judiciously
I should walk over and draw the thing back,
I'd get an armful of blue electricity
Something like Jove from Olympus once hurled,
Jarring me out of my trustful simplicity;
I'm the unluckiest guy in the world.



Patching cuts or resetting hips

News From the Capitol



UNIFORM cost accounting has been brought measurably nearer during the last week. Complaints, growing out of the prices decreed by the President, have been registered in person by operators hailing from practically every coal-producing field in the United States. While only four formal hearings were conducted, numerous operators have conferred informally with officials at the Federal Trade Commission and at the offices of the coal administration. They were assured at each place that the Government is ready and willing to make any adjustment when it is proved that the announced list of prices does not do substantial justice. The exception is made in this connection of those operations which, by their very nature, cannot be conducted economically. In connection with these complaints, cost figures are being demanded. Many of those which have been submitted display such a woeful lack of uniformity and such diverse methods of calculating costs, that great difficulty is being experienced by operators in their efforts to make a case.

All negotiations between the operators and the Government officials have been handicapped by the fact that no general policy has been announced. Dr. Harry A. Garfield, the coal administrator, was engaged until the close of the week with the important matters involved in the fixing of the price of wheat. He found time, however, to confer briefly with Judge Robert S. Lovett and W. B. Colver, representatives of the National Association of Coal Operators, with George Otis Smith, the director of the Geological Survey, with Van H. Manning, director of the Bureau of Mines, and other persons closely in touch with the coal situation. Dr. Garfield evidently is relying upon Francis S. Peabody, chairman of the Committee on Coal Production, for information. In addition to numerous conferences, he has called upon Mr. Peabody to reduce to writing the conclusions that he has formed as a result of his experience during the past few months.

In connection with the matter of contracts, Dr. Garfield made this statement: "Until further ordered by the President, his proclamation of Aug. 21 does not affect bona fide contracts enforceable at law and entered into before that date." Dr. Garfield expects soon to announce a complete coal control policy. Many are of the opinion that he will announce at that time the intention of fixing retail prices. This opinion was strengthened by the fact that representatives of retailers in New Orleans and in Birmingham, Ala., appeared before the Federal Trade Commission during the week, evidently by invitation, to show why a larger margin of profit should prevail in those cities.

A violent drop of 10 per cent. in the nation's coal production, chargeable almost entirely to labor troubles, is shown in the weekly coal statement issued by the United States Geological Survey. The ratio of tonnage produced to full-time capacity was 62.5 per cent. as compared with 71.8 per cent. There has been a steady decline in production since the week ending July 14, when the production percentage reached 78.1. Illinois, eastern Kentucky and Tennessee are largely responsible for the loss in production. In Illinois, production decreased from 70.3 to 54.8 per cent. In eastern Kentucky and Tennessee, production decreased from 74.2 to 10.8 per cent. Southwestern Virginia continues to hold the palm for high production. The mines in that region were operated at 93.9 per cent. of full-time capacity. The mines in this district have an average of more than 93 per cent. for the entire summer.

An increase of three per cent. in the amount of coal cars loaded during the week is shown by the report. The loss of production due to unfilled car orders decreased from 13.4 to 11.2 per cent. It is pointed out, however, that this increase has been made possible by the falling off in production in the districts affected by strikes.

Beehive coke is being produced at the rate of 71.6 per cent. of rated capacity. This is an increase of 1.4 per cent. over the production of the preceding week. One-fifth of the rated capacity of the ovens was lost, due to a scarcity of yard labor. The car situations shows an improvement. The loss of production chargeable to this reason was only 3.3 per cent.

"The smaller operators have a right to exist because most of them mine normally. It would be an impractical proposition to shut down anything but a very small mine or a very 'wet-weather' mine, with the idea of transferring the labor to other mines. When you investigate it, you will find there are very few mines in Alabama that you will want to recommend for shutting down." This is an extract from the statement of M. W. Bush, of the Imperial Coal and Coke Co., of Birmingham, Ala., who made the plea for increased prices for Alabama coal when a group of operators from that state appeared before the Federal Trade Commission. The Alabama operators claim that the larger mines in that state must have 50c. a ton over the cost of production. In the course of the hearing, Governor Fort, of the Federal Trade Commission, intimated that he thinks 35c. above the cost of production would be a fair profit. Owing to the primitive methods of cost accounting at many of the Alabama operations, great difficulty is be-

ing experienced in ascertaining exact costs. The Alabama operators submitted a great volume of cost data to the accountants of the Federal Trade Commission and an effort will be made to arrive at a fair average of costs for each class of mining operations.

Among the reasons pointed out to the Federal Trade commissioners for a higher price on Alabama coal were the following: The thirty seams of coal in that state vary greatly. Faults are many and practically every mine in the state makes a large quantity of water. While Alabama produces only 3 per cent. of the nation's coal, it produces 40 per cent. of the washed coal output of the country. The South has lost 750,000 negroes as a result of the migration to the north, resulting in a more acute labor shortage than exists in any other portion of the United States.

The delegation which represented the Alabama producers at the hearing before the Federal Trade Commission consisted of: M. W. Bush, S. L. Yerkes, W. E. Henley, E. L. Adler, D. H. Brown, Erskine Ramsey, G. F. Peter, W. S. Lovell, James Bonnyman, E. J. Rowe, Clarence Moss, Frank Nelson, W. C. Adams and J. F. Rushton.

Conferences along similar lines were held with operators representing the McAlester, Lehigh-Coalgate, McCurtain and Henryetta districts of Oklahoma and the Black Mountain district of Virginia.

After two days spent behind closed doors in discussing the coal situation, the directors of the National Association of Coal Operators issued the following statement: "The directors of the National Association of Coal Operators and other bituminous operators representing practically all coal producing districts of the United States have conferred with Dr. H. A. Garfield, the fuel administrator, regarding his plans and policy. Following a full discussion, Dr. Garfield stated that he would promptly issue a public statement concerning these matters."

Those attending the conference were W. K. Field, Pittsburgh; J. H. Wheelwright, Baltimore; F. C. Honnola, Chicago; A. M. Ogle, Terre Haute; George H. Barker, Columbus; Rembrandt Peale, New York; Howell J. Davis, Knoxville; J. J. Tierney, Philadelphia; J. C. Osgood, Denver; J. D. A. Morrow, Pittsburgh; D. R. Lawson, Fairmont, W. Va.; W. D. McKinney, Columbus; Arthur Hale, Baltimore; S. L. Yerkes and George F. Peter, Birmingham.

Conferences between representatives of several railroads and the Committee on Coal Production, looking to changes in the practice of loading company coal, have been unproductive of results. The committee on Coal Production had been hopeful that loading of railroad coal could be distributed through the week.

In a statement outlining the Government's coal-control policy, which was made public on Sept. 5, Dr. Harry A. Garfield, the fuel administrator, answered several questions that have been bothering the coal operators ever since the President's proclamation fixing the prices of both bituminous and anthracite coal. First, the statement says that the President's order fixing prices includes export and bunker coal. Second, that

though the prices fixed are provisional, they will not be changed unless good cause is shown. Applications for revision of prices should be accompanied by cost statements presented in writing, and should cover at least the years 1915, 1916 and 1917. Third, Dr. Garfield states that contracts made previous to the President's proclamation will not be affected, provided the contracts are bona fide in character.

Output of Anthracite Mine Workers

According to the figures of the State Department of Labor, the number of men employed in the anthracite region during 1916 declined immensely, as the table here published shows. The decline was quite uneven, the biggest loss being in the contract miners' laborers, where it amounted to nearly 25 per cent. The contract miners did not appear to leave their work to anything like the same extent, a decline of only 5.85 per cent. in their numbers being noted.

The production of coal in 1916 is said to have included a much larger proportion of washery coal than in 1915. This must be remembered in accepting the figures for tonnage per man-day here given. The output of the contract miners and mine laborers should be reduced for both 1915 and 1916 in accordance with the amount of washery coal produced, but the amount of that coal for 1916 is not known at present.

Occupation	1915 Number	1916 Number	Numerical Per Cent. Decrease	
			Decrease	Decrease
Contract miners.....	46,422	43,706	2,716	5.85
Contract miners' laborers.....	36,379	27,751	8,628	23.72
Other inside labor.....	48,495	44,635	3,860	7.96
Outside labor.....	46,043	43,077	2,966	6.44
All labor.....	172,339	159,169	18,170	10.25
			1915	1916
Production of coal in gross tons.....	79,801,523	78,292,052		
Production of coal in short tons.....	89,377,705	87,687,098		
Average number of days worked.....	221	221		246
Man-days worked by miners and miners' laborers.....	18,299,021	17,578,422		
Man-days worked by other labor.....	20,892,898	21,577,152		
Man-days worked by all labor.....	39,191,919	39,155,574		
Output per man-day for miners and miners' laborers, gross tons.....	4.36097226	4.45387259		
Output per man-day for miners and miners' laborers, short tons.....	4.88428893	4.98833730		
Output per man-day for other labor, gross tons.....	3.81955260	3.62847015		
Output per man-day for other labor, net tons.....	4.27789891	4.06388657		
Output per man-day for all labor, gross tons.....	2.03617289	1.99951230		
Output per man-day for all labor, net tons.....	2.28051363	2.23945378		
Percentage increase in output in man-days for miners and miners' laborers in 1916.....		2.130266		
Percentage decrease in output per man-days for other labor in 1916.....		5.002745		
Percentage decrease in output per man-days for all labor in 1916.....		1.800466		

Clearly, then, in 1916 the anthracite region lost 5 per cent. in the daily output of its day workmen and 1.8 per cent. in the daily output of its whole working force. This was the outcome of the shorter day. Just how far the increased washery coal has served to prevent the outcome from appearing more unfortunate has yet to be told. However, one should not regret the eight-hour day even if it does reduce output a little. Under normal conditions output is not the only desideratum.

It has just been said that this "was the outcome of the shorter day." Perhaps this is not a wholly fair statement, for the shortage of miners and miners' laborers was the cause of a shortage of coal, and that shortage made the day hands have less coal to handle. Thus the loss of efficiency may have been rather due to lack of opportunity than to lack of ability and good will. Statistics are full of pitfalls.

The Labor Situation

General Labor Review

There are no serious difficulties in the anthracite region, but still it is discouraging to note that there is a growth of disaffection, which if it continues, will make operation as unsatisfactory as it was when the United States entered the war, Apr. 6. After that date the Industrial Workers of the World made the bulk of the trouble. Eventually they were squelched, and now the United Mine Workers in a more decent but in an equally persistent manner are interfering with production.

Before long output will be back at its old low levels. The United Mine Workers will not be able to show that the Industrial Workers of the World hinder business any more than their own organization, though it is questionable what the I. W. W.'s might do if their membership was as large and as widespread as that of the United Mine Workers. The mine workers still agitate for a discussion of the "closed-shop." If it is granted, it will be to prevent a strike and not because a closed shop will give harmony or satisfaction. An early conference is said to have been promised. The outcome is in doubt.

BITUMINOUS MINE WORKERS SEEK NEW SCALE

In the bituminous regions the miners are seeking higher wages. Earnings were never so large in either cash or purchasing value. The mine workers claim that the increased purchasing power is only secured by steadier work, and they want remuneration provided in proportion to their increased total, even though it was only Apr. 17 when the last agreement was made.

On Aug. 28 the mine workers asked the operators of the central competitive field to meet them on Sept. 6 to discuss an increase in wage. The decision was reached after a meeting in which the international officials of the union and the presidents of the districts of Illinois, Ohio, western Pennsylvania and Indiana all took part. The officers of the union purpose asking not only for an increase of wages for themselves but also an advance in prices for the coal operators should that be found necessary to safeguard the industry.

PRESIDENT BREWSTER WOULD GRANT ADVANCE

It is interesting to note that some operators are not opposed to a readjustment of wages if prices can be simultaneously modified, judging by a letter of Thomas T. Brewster, president of the Coal Operators' Association of the Fifth and Ninth districts of Illinois. He writes: "Neither party to a contract can be denied the right to discuss the contract at any time. Though the agreement made in April, 1916, for two years lasted but one year and the revision made but four months ago appears to be unsatisfactory to the miners, I am not discouraged and shall keep at it, hoping that some time we shall be able to make a contract satisfactory to both operators and miners. We need the miners in the mines, not in the army or in foreign lands." What the last sentence means one cannot attempt to say. Surely wages are not to be raised to prevent enlistment, and their raising cannot prevent conscription. Apparently Brewster's reason for raising wages is to compete in the labor market with other industries, though he does not say so.

ILLINOIS IS PEACEFUL AT PRESENT WRITING

All the central Illinois miners who went on strike to assist the company men in obtaining an increase in wages are back at work. Five locals held out last week against President Frank Farrington's orders requiring the mine workers to return to work, but a notification that the locals would lose their charters unless they obeyed by Monday brought them to time.

Strong appeals are being made by Farrington and other officials that the men stay at work until the joint conference of miners and operators called for Sept. 6 at Indianapolis is concluded. In a communication which Farrington has sent out he says that a strike at this time would be the most flagrant violation of every fundamental of the United Mine Workers of America.

FARRINGTON WILL NOT HAVE CONTRACT BROKEN

"So far as agitation in favor of wage increase is concerned," writes President Farrington, "you are advised that the officers of your district organization have been on the alert and are thoroughly familiar with the situation and will take advantage of every opportunity that presents itself to increase the wages of our members." The next paragraph of this letter sheds considerable light on President Farrington's stand.

"This is not intended," he says, "to hold out any promise that there is a likelihood of securing a wage increase before the expiration of our present contract, but we do promise that we shall take advantage of any opportunity that may present itself to bring about an increase. So far as the agitation on the part of the shift hands for an increase is concerned, you are advised that the officers of your district organization recognize that the wages of shift hands are too low as compared with the wages of the miners, and we are doing everything in our power to equalize the inequality. But anything that is done must be done in strict accord with the requirements of our joint agreement."

He warns the members against the activities of the Franklin County Ways and Means Council and the Educational Council of the Ninth District, which he says are trying to destroy the mine workers' organization.

The mine workers employed at the three large shafts at Christopher and Ziegler met recently at Duquoin, Ill., and decided to remain at work pending an adjustment of wage matters. They had intended to strike on Sept. 1.

MINE WORKERS WANT TO SECURE WAGES BY BOND

The miners at the Hart-Williams mine in Benton, Franklin County, have a new form of grievance and perhaps not an unreasonable one. The previous owners went bankrupt and owed the miners for several months' work. When the Taylor Coal Co. took charge the men demanded that the new operator give bond insuring payment in full on all payrolls accruing from that time on, and they are on strike to enforce that condition.

In Ohio there is a dispute which shows that the working man can at times exhibit an almost unbelievable perversity. The coal companies have secured the miners against an increase in supplies. They have been keeping rent, the cost of powder, oil, squibs and what not at the pre-bellum prices in supplying their men. Coal is sold at the same figures, though the wages paid for the digging of it have increased immensely.

WANT OPERATOR TO PAY COAL-DELIVERY EXPENSE

The new Pittsburgh Coal Co. at Athens, Athens County, and Murray City, Hocking County, in the Hocking Valley, has been willing to supply run-of-mine coal to its men at \$1.25 per ton plus the cost of delivery. The mine workers want it delivered at that price. There are four mines and 1500 men, who are on strike to secure this concession from the coal company.

The strike in the eastern Kentucky and Tennessee field is a complete failure. It is said that the operators signing up with the union are so inconsequential that they produce only about 2 per cent. of the output of the district. The strike

is also averted in the Alabama field. The union has no money to finance strikes properly, and the strikes it starts have in consequence no vitality. All the recent strike activity has done injury to the union. The miners are sore because proper support has been withheld from them. "O'er vaunting ambition" has not been good for the union. It is gratifying that strikes started in time of war and a coal shortage with the express purpose of taking advantage of the public need have proven completely unsuccessful.

ROCKEFELLER'S MEN ASKED TO CONDEMN "PLAN"

In Colorado a few employees of the Colorado Fuel and Iron Co. have been signing a protest against the Rockefeller plan, the protest to be presented to John D. Rockefeller, Jr. It is merely propaganda. No one feels hurt, injured or offended by an organization which serves only to brighten the lives and improve the working conditions of the employees. The attitude of the union is natural. It does not like the competition of Rockefeller's private organization.

In the Drumheller coal fields of northern Alberta 600 mine workers at the Atlas, A. B. C., Inter-Midland, Drumheller, Premier and Coalhurst mines have come out on strike, the trouble being a dispute about the wage to be paid cutters, loaders and scrapers for the recently introduced mining machines. Coal Commissioner Armstrong is discussing the scale with President Briggs of the United Mine Workers of America.

The Crow's Nest Pass Coal Co., Ltd., writes us that the figures in our issue of Aug. 11, p. 247, relating to the pay of coke-oven employees were the figures originally arranged between the contracting parties. The final settlement is, however, as follows:

Leveling and drawing, 6½-ton charge per oven,	\$1.30
Leveling and drawing, 5-ton charge per oven.....	1.05
Loading box or open cars (under 200 tons per month), per ton	0.23
Loading box or open cars (over 200 tons per month), per ton	0.21

The Pressure for Wage Uniformity

The anthracite mine workers seem lately to have become keenly troubled over the difference in wage paid for identical operations at different mines of the anthracite region. Differences in contract prices for men employed at the same occupation seem reasonable because of the differences in the time required to perform those identical operations with coal of different quality, but when pay is by the day it is hard to explain why rates are not uniform, especially where the conditions are quite similar so that the burden of the work and the expertness it demands are measurably equal.

Now these difficulties are not in the interpretation of the contract. They are difficulties with the contract itself and should be left till the contract becomes void in 1920. It does not seem possible that the men can obtain a decision even though there is a great deal in their contention. It has the weakness, however, that it is not so writ in the bond.

The companies only a year ago, with much diligence, listened to the demands of the representatives of the mine workers, and uniformity of wage was not granted and possibly was not even asked. It seems a mistake to bring up the question now. One could not blame the men for presenting it in 1920, though it would create an economic inequality that would be unfortunate for some of the companies.

It appears that the Peoples Coal Co. pays \$2.67 per day to firemen, the Pennsylvania Coal Co. pays \$2.51 while the Delaware & Hudson Co. pays only \$2.37 and the Delaware, Lackawanna & Western R.R., Coal Department, gives its men \$2.38 per day. The companies stand by the contract, contending that it is useless to sign one if it has no permanent value when signed.

Attention has already been called to the strike of the "motormen" at the Buttonwood, Parrish and Inman No. 21 collieries of the Lehigh and Wilkes-Barre Coal Co. The men there desire to get the rate in force at another

colliery where the scale is higher. They returned to work Sept. 4. In another place in this department reference is made to the trouble at the Packer No. 4 colliery.

To men who strike against the contract and thus cut themselves loose from all their obligations it is useless to point to the conciliation court, which, however, grinds out its decrees, not by any manner of means always, or even usually, in favor of the coal companies.

On Aug. 30, for instance, the Taylor colliery case was settled not at all favorably to the Delaware, Lackawanna & Western R.R. Coal Department. The board decided that the company must pay when the coal is not undercut clear to the bottom and the "miner" has to lift the coal. This settled the issue, which threatened the peace at several collieries. There were eight other grievances, two of these were passed on to the umpire, the others were settled there and then.

The discontent which has recently arisen with regard to the contract is most unfortunate, for the demand for coal is still quite pressing. The need for patriotism strongly backs the demand for an observance of contracts. Men are still short in the anthracite region and those there are must work every day to fill the needs of the industry. The G. B. Markle Co. and the U. S. Wentz Co. are seeking exemption from the army draft for all their men. Are men to be exempted to stand around and strike against a contract they have signed of their own volition?

Motormen Seeking Selfish Ends

The trouble in Russia is that certain people seek to obtain their own ends regardless of the effect of their actions on the public welfare. Everything is viewed by these unpatriotic persons as if they alone of all people had rights and needs. As a result conditions are chaotic and the country is defeated by the enemy's weakest battalions.

There are people in America not a bit more patriotic or reasonable, and if they are permitted to run their course they will seriously hamper our efforts. Two electric locomotive operators at the Packer Colliery No. 4, of the Lehigh Valley Coal Co., located at Shenandoah, Penn., have shut down three big mining operations in the anthracite field for four days in order to obtain an increase of 4.1c. an hour.

As a result 1100 mine workers, who, when permitted to work, earn in aggregate more than \$3000 a day, were laid idle for four days; and the country, which is in sore need of the fuel and clamoring for it, has been deprived of 7000 tons a day.

FOR LESS THAN A DOLLAR MEN LOOSE THOUSANDS

The two motormen receive 32.4c. an hour, which is the standard rate for that class of workmen, the rate being fixed in the recent agreement between the mine operators and the union leaders when an increase of 4.5c. per hour was made in their wages. Only these two men are making the fight for the increase, but they have succeeded in prevailing on 1100 men not to work until they get it.

"This trouble came without warning," said F. M. Chase, vice president and general manager. "The men demanded 32c. an hour and said they would tie up the collieries if the increase was not granted. We called their attention to the wage agreement, but this made no impression. We suggested that the matter be sent to the Board of Conciliation for a decision—if this board decides in their favor they get the increase from the day they made the demand—but they would not do this. The strike followed.

"We had hopes of making a record for coal production in August. We are mining every ton of coal possible during this period of national emergency, but our efforts are made extremely difficult by the lack of coöperation on the part of the men.

"This strike involves only 66c. a day, but we could not grant the demands without breaking our signed agreement with the union, which we are living up to in every detail. Despite this same agreement these men struck, taking with them 1100 men who have already sacrificed about \$12,000 in wages on their account."

Wilson Settles Alabama Strike

The Alabama strike never became any more than a local affair. It was delayed by the orders of the union until the differences that gave rise to it were discussed. Fortunately, a compromise was found possible after six days of conference with the United States Secretary of Labor, William B. Wilson. The agreement was made Monday night, Aug. 27. Mr. Wilson's statement is as follows:

I have heard both sides of the labor dispute now existing in the Alabama coal fields and in view of the present war necessities make the following suggestions:

COAL OPERATORS WILL EMPLOY UNION MEN

1. That the miners recede from their demand for recognition of the union.

That the coal operators of Alabama recognize the right of employees to join any union, labor organization or society they may choose, and agree that they shall not be discriminated against in the distribution of work for having joined such organization, provided always that in their affiliation and in the conduct of the organization nothing is done to disturb the relations existing between employer and employee, by methods of intimidation or coercion, and provided that employees joining any organization recognize the right of each employee to join or not as he may individually decide, and also recognize the right of the company to insist that no employee shall use the company's time for any purpose other than that for which he is paid, and that he must not interfere with the operation of the mine, or knowingly do that which will reduce the output.

That they will, upon application through the usual channels for employment, reemploy any man who has been discharged, if there be any, solely for joining the union, but will not obligate themselves to reemploy any man who has made unlawful threats or committed unlawful acts unless the employer is satisfied that the same acts will not again be committed by the applicant.

CHECKWEIGHMEN TO BE UNIVERSALLY RECOGNIZED

2. That the right of the miners to place checkweighmen on the tipples, to see that their coal is properly weighed and credited, should be fully recognized. The same to be elected and paid for by the miners without any interference as per the laws of the state. All coal to be weighed and paid for as per standard weights at all mines equipped with scales.

3. That semi-monthly pays should be established where they do not exist.

4. That the managers receive committees of their own workmen selected at meetings called for the purpose not oftener than every three months, to present any grievance that they may have to submit, which shall not include any matter herein waived or postponed. If they fail to arrive at a satisfactory adjustment of the grievance or grievances complained of, the same to be submitted to the Department of Labor for final adjustment, it being understood that a decision will be made within 30 days after submission.

It is further understood that any grievance arising must first be taken up by the individual or individuals affected, with the foreman or officials having authority over such dispute, and they failing to agree, it shall be taken up through the committees as above provided.

NEW WAGE SCALE IS "INDEFINITELY POSTPONED"

5. The consideration of the hours of labor, relative prices of differentials, machine operations, local inequalities and uniformities and the abolition of the contract system be indefinitely postponed.

The 96 local unions were instructed by the union officers that the strike must be indefinitely postponed. This decision will probably result in a speedy settlement of the strike which is now actively in progress in southeastern Kentucky and in Tennessee.

Strike Fails in Kentucky

The operators in the field comprising southeastern Kentucky and Tennessee claimed, on Sept. 1, that the strike would be brought to a conclusion at once. All the larger operations were preparing to resume, and the operators declared that they had assurances that the men would return to work.

It was stated that the mine workers were discontented with the union because it had failed to support the strike

in the manner promised. The men assert that the union officials had agreed to give every married man during the continuance of the strike \$30 a month, an additional allowance of \$5 being provided for each child. But this assistance was not forthcoming, and the union men are little disposed to obey the orders of a union that does not keep its promises. Some papers have declared that the mine workers were winning. On Aug. 29 a statement was published that 63 companies had signed up. It is true that numbers of operators have made terms with the strikers, but invariably they have been operators who are conducting only small mines.

An account of the situation, which is described as authoritative, declares that the operators that have met the terms of the men represent only about 1 per cent. of the output and that these operators made terms only in order that they might complete deliveries on orders taken at higher prices than the schedule rates specified in the President's recent ruling. It was alleged that their mines would have to close down if they had to sell spot or newly contracted coal at the new schedule.

It is impossible to discuss the strike situation and the price schedule as if there were no relation between them. It is declared that hardly a mine could run if the Kentucky scale as promulgated by the President is maintained. Though in many cases the operators have felt sure that they could resume at pleasure, they have not done so because no profit could be made at the prices imposed on the district. Reduced prices have knocked the bottom out of the strikers' case and even a settlement on the "Alabama plan," little as it concedes to the union, does not commend itself with much force to any of the employing organizations.

War Wages in German Coal Mines

The *Iron and Coal Trades Review*, of London, England, reports that the wages of mine workers in Germany have increased nearly 50 per cent. despite the inferior ability of the men who now replace those drawn away for war. The net wages for the first quarter of 1917 and the increases over the second quarter of 1914, at the conclusion of which the war started, are as follows:

GERMAN MINE WORKERS' DAY WAGES AND INCREASE SINCE WAR BEGAN

District	Miners and Trammers		Other Underground Workers		Outside Workers	
	Day Wage	Increase	Day Wage	Increase	Day Wage	Increase
Upper Silesia	\$1.72	47.0	\$1.20	41.7	\$1.10	41.7
Lower Silesia	1.28	35.6	1.13	34.7	0.96	26.2
Dortmund	2.23	50.7	1.48	36.5	1.41	35.0
Saarbruecken*	1.69	39.4	1.32	33.7	1.26	57.0
Aachen	1.80	38.3	1.33	28.4	1.23	25.0
Lower Rhine†	2.19	49.0	1.65	38.1	1.43	35.1

* State Mines. † Left bank.

We may be permitted, however, to presume that the lower increases and poorer pay in the two latter classes are due to the "dilution" of labor with old men, women, prisoners of war and forced labor. But even granting this, the highest wage paid to miners in that paradise of the laboring men, Germany, since the war is \$2.23 per day. Before the war it was only two-thirds as much, or \$1.48.

Washington Miners Want Their Beer

Several coal mine unions in the Roslyn and Cle Elum fields of Washington, as also in Kansas are protesting that if there is to be no beer there will be no coal. The slogan is "No beer, no coal." The mine workers expect to compel the state legislature to authorize the manufacture of intoxicants in the State of Washington or to compel the Federal Government to permit the import of intoxicants. The mine workers will have to learn that they must not establish themselves as lawmakers and law breakers. The laws are passed by the representatives of all the people and cannot be abrogated by any one class. Suppose, owing to the shortage of gasoline, the use of automobiles is forbidden, would the operator be justified in saying: "No automobiles, no coal."

Legal Department

Recent Decisions

BY A. L. H. STREET

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RECOVERY ON ACCOUNT OF AGGRAVATION OF DISEASE—A mine employee is entitled to an award under the Illinois Workmen's Compensation Act to cover aggravation of a tumor, such aggravation being caused by a personal injury sustained during the course of his employment in a mine. (Illinois Supreme Court, Big Muddy Coal and Iron Co. vs. Industrial Board of Illinois, 116 Northeastern Reporter, 662.)

CONTRIBUTORY NEGLIGENCE OF MINER STRUCK BY CAR—Contributory negligence bars recovery for injury to a miner who was struck by a motor car while proceeding along a narrow mine passageway in going from his place of work to the bottom of a shaft to leave the mine, if, by reason of hearing the approaching motor while it was 500 ft. away and seeing its headlight 140 ft. away, he could readily have reached one of the places of refuge provided at distances of not more than 60 ft. apart along the way. (Texas Court of Civil Appeals, Trojan vs. Strawn Coal Co., 195 Southwestern Reporter, 256.)

DAMAGES RECOVERABLE FOR ELECTRIC SHOCK—While engaged in cleaning coal from a motor road in a mine, plaintiff, an employee of the coal operator, was injured by an electric shock, due to his coming in contact with an uninsulated trolley wire which had negligently been permitted by the operator to sag within a few feet of the track. Before the accident, plaintiff had been a strong, able-bodied man, but the injury, although not of a permanent nature, resulted in neurasthenia, insomnia, nervous headaches and loss of appetite. Held, that a verdict for \$898 was not excessive. (Kentucky Court of Appeals, Debose vs. Ohio Valley Coal and Mining Co., 195 Southwestern Reporter, 476.)

UNLAWFUL DISCRIMINATION BY RAILROADS—Under the statutes of Pennsylvania which impose treble damages against a railway company for unreasonable discriminations against shippers, the actionable injury sustained by a shipper may consist in a difference of rates charged or in loss sustained as a direct consequence of the discrimination. If a railroad company allowed plaintiff's competitor rebates of so much per ton on coal shipped to him, and an additional amount to cover coalyard rental, plaintiff is entitled to recover the excess of amounts paid by him above what he would have paid had he been accorded the same allowances. (Pennsylvania Supreme Court, Hall vs. Pennsylvania Railroad Co., 100 Atlantic Reporter, 1035.)

SURFACE SUPPORT UNDER CONVEYANCES OF COAL IN PLACE—Under a conveyance of coal in place, the grantee assumes the duty of supporting the surface, in the absence of agreement to the contrary. Where a coal company, owing several lots, conveys the coal in place under one lot under a deed requiring the grantee to support the surface, omission of a similar provision in a deed to the coal lying under the other lots implies a duty on the part of the grantee under the second deed to provide surface support. Although an owner of land sells the surface, reserving underlying coal without obligation to support the surface, and afterward sells the coal, the purchaser of the coal does not take it free from such obligation, in the absence of express provision to that effect. But the obligation may be released afterward by a confirmatory conveyance, quitclaiming all interest in the premises. (Pennsylvania Supreme Court, Penman vs. Jones, 100 Atlantic Reporter, 1043.)

KANSAS COMPENSATION ACT APPLIED—A Kansas coal-mining company operates two open-pit mines about a quarter of a mile apart. In crossing an interurban railway track running between the two mines, an employee was struck by a car and fatally injured. Held, that although he was engaged in performing an errand within the scope of his employment, there could be no award under the Kansas Workmen's Compensation Act, because he was not injured "in or about the mine," within the provisions of the law limiting its application to such injuries. (Kansas Supreme Court, Bevard vs. Skidmore-Patterson Coal Co., 165 Pacific Reporter, 657.)

QUANTITY REQUIRED BY SALE CONTRACT—Under a contract for the sale of from 96,000 to 120,000 tons of coke, to be delivered within one year in equal monthly installments of from 8000 to 10,000 tons, as ordered out by the buyer, where the buyer in the first five months ordered less than 8000 tons monthly and settled with the seller on the basis of damages for failure to order out that minimum quantity, there was an election on the part of the buyer to treat the agreement as not binding the seller to deliver more than 8000 tons monthly, and the buyer could not afterward require delivery of greater quantities. (Pennsylvania Supreme Court, Dimmick vs. Banning, Cooper & Co., 100 Atlantic Reporter, 871.)

SCOPE OF COMPENSATION ACT—An employee of a coal-mining company injured on or near the company's premises, while off duty and through the negligence of the company, is not subject to the provisions of the West Virginia Workmen's Compensation Act and is entitled to maintain an ordinary suit to recover damages. Where a coal tipple is situated near the main line of a railroad company and the mining company knows that pedestrians frequently use the railway tracks in passing the tipple, there is a legal duty to exercise care in casting slate toward such tracks, in the process of loading coal at the tipple, and the mining company is liable for negligent failure to discharge such duty if it results in an injury to a pedestrian. (West Virginia Supreme Court of Appeals, Cox vs. United States Coal and Coke Co., 92 Southeastern Reporter, 559.)

MINE LESSOR'S LIABILITY; CONTRIBUTORY NEGLIGENCE IN BLASTING—Where an owner of a coal mine has leased it to another for operation, he is liable for injury to the lessee's employees only when the accident has resulted from some act of negligence on his part, or when he has expressly assumed liability under the lease. A mine operator must keep the entries of the mine in reasonably safe condition for the miners who are required to use them in going to and from their places of work. If an operator knows of a dangerous condition in a mine entry roof before an employee is assigned to the place to do blasting, and fails to warn the latter against it, there is liability for resulting injury, except as the rules of the mine may require the employee to first examine the roof. In Kentucky, a rule requiring miners to examine roof is not binding on them unless posted as required by state law. But, regardless of established rules of a coal company, a miner is guilty of contributory negligence in failing to examine a roof before going under it where he has fired shots in the place. In an action for injury to a miner, due to falling of an entry roof after blasting, condition of the roof at a point 50 ft. distant from the place of accident has no legal bearing as evidence of the condition of the roof at the particular place. A miner engaged in enlarging an entry assumes the risks naturally incident to his work. (Kentucky Court of Appeals, Stearns Coal and Lumber Co. vs. Spradlin, 195 Southwestern Reporter, 781.)

Editorials

Who Shall Pay for This War?

THE papers and financiers discuss "Who Shall Pay for This War, Ourselves or Our Posterity?" as if the question were one which we could decide to suit ourselves, as we would settle who should pay the bill at a hotel. But there is no way of avoiding the fact that it is we who must and we who shall pay for it. It cannot be left to posterity by any manner of jugglery.

For from us must come every engine of war we use, every pound of food we consume. We must scrimp, save and slave for it, or it will not be ours. No future generation will buy it for us, and in no large degree even can any past generation provide it except in that it has provided the means for making the engines of warfare, not the cost and material of making them.

We may, it is true, borrow what we need for the war; but we borrow it of our own people, who must save with niggardliness to secure it or it will not be secured. It takes just as much self-denial and physical pain to save a billion dollars to loan as to save it for a donation, though the mental process may be less harrowing.

If we could go successfully to Great Britain or France and say, "Lend us a billion and we will buy supplies of you," then we would be unloading a burden on posterity. But the process is reversed. Great Britain and France are borrowing of us. We are thereby putting the greater burden on ourselves. By our loans to Europe we are lightening the burden on our posterity and burdening our own shoulders.

Twenty-one billions a year out of a gross income of forty billion is what the Government seems now likely to call for—fifty-fifty—fifty for munitions and soldiers' equipment and fifty for ourselves. The struggle, then, if made on the scale suggested, is going to be severe!

Before a second issue of Liberty Bonds is on the market nearly three-quarters of a year will have passed with only one-tenth of the gigantic yearly sum raised and nine-tenths yet to raise. It seems that we hesitate to meet the full severity of the conditions that confront us.

We cannot surpass ourselves like Great Britain, for we have always more closely approached our best than the island kingdom. We were always organized for commerce. We had few idle rich; our "week ends" comprised Sunday and perhaps Saturday afternoon; we had no male flunkies; we tended our own gardens; many of our daughters who did not get married went to business; we had only comparatively few and relatively harmless trade-union restrictions. To sum up, we had few slack ends to piece together. War will probably deprive us of far more working hours by the absence of our soldiers than we can manage to add by diligence to our total in industry.

Taxes on the rich men can avail us little unless the rich make abnormal profits and we let them go on making them. If wages are to be raised proportional to the cost of living and prices cut so as to destroy profits, the rich man cannot pay for the war. We must go deeper. We must all give our fifty-fifty. Every meal must be half munitions and half provender; we must lay down our rent twice—half must go to the landlord and half to the army. Militarism is as bad as we always said it was. It is bad enough to justify this war and all it entails. It is not a cheap and easy thing to meet.

It cannot be met with the cry of the merchant, "Let the consumer buy as before and the merchant sell at a reasonable profit." There must be a new alignment of everything. Some businesses must wait for peace. That is the only way in which we can make posterity pay—by our not doing our share in the development of our peace standing. We can wait for post offices, roads, public buildings, canals, automobiles, residences, and what not, confident that the habit of saving in the war will give us the wherewithal later to buy whatever may be needed when the war is over. This is the only way in which we can make the future pay for the present. We cannot do it merely by replacing taxings by borrowings. The objection to taxes is psychological, not economical. Here, however, a concession must be made. Who shall say that psychology is not an important item in finance and in war?

Eight-Hour Day in Anthracite Mines

AN AGENT of the United States Bureau of Labor, A. Paul F. Brissenden, has written an article for the *Monthly Review* of that organization to show that the productivity of labor in the anthracite mines has not been in any way reduced by the 11 per cent. reduction in the working day which went into effect May 9, 1916.

The article is almost amusing, for the working day was not decreased for the miners and mine laborers on May 9, 1916, yet it is on the change in their output that the argument of Mr. Brissenden is almost wholly based. Prior to that time these men left the mine when they would. When the coal companies reduced the hours of the day hands to eight, they insisted on their miners and mine laborers staying in the mines the full eight hours, and there was much unrest as a result.

The miners and miners' laborers pleaded reasons for leaving early, and somewhat unwillingly some exceptions were held by the companies as justifying an early quitting. At one mine a charge of violation of the state laws was brought against the coal company when it refused to hoist men from the mine before quitting time.

So far from granting shorter hours to the contract men after May 9, 1916, the companies demanded and contracted for longer hours. Still the length of time actually worked by the two classes of contract men is hard to determine. Whether they work more or less hours is not a matter of verification.

A time clock was, it is true, placed at one mine at a time not so far distant, but the miners would not work till it was removed. It is impossible therefore to tell just how long they do work and whether the time is increasing or diminishing. It has been denied by excellent authority that the contract men are working more hours per day than before, and the increased tonnage produced in 1917 is said by the same informant to be due solely to an increase in the number of days that the mines are now being worked.

But the point to be determined is not how long the miners and miners' laborers' work, for the interesting question is how much the coal output per day man has been increased or decreased since the hours of day men were reduced from nine to eight hours.

Brissenden's figures do not agree with those of the Department of Mines of the State of Pennsylvania, but assuming them correct so as to show the error in his conclusion, we may deduce the following results:

	1915	1916
Inside labor, exclusive of contract miners and their laborers.....	44,809	40,806
Outside labor.....	40,230	37,756
Total labor.....	85,039	78,562
Production of coal, short tons.....	80,953.537	79,798.644
Average number of days worked.....	230	253
Man days worked by above mine workers.....	19,558.970	19,876.186
Output handled per man day by above mine workers, short tons.....	4,138.9468	4,014.7854
Per cent. of decreased production per man day 1916 over 1915 for such mine workers.....		3.0

Instead of the foregoing figures, Brissenden shows that there was an increased production of 2.9 per cent. for miners and miners' laborers, showing only that with a day of undetermined length a larger production was secured. He also shows that there was an increased production of 1.4 per cent for all labor, showing that the net result of working some men indeterminate hours and other men shorter hours increased the production. There is nothing startling about that.

What would be interesting, if true, is that cutting the day mine workers' time 11 per cent. only reduced the tonnage per man-day 3 per cent. The efficiency of the miner and the miner's laborer means little to the operating company. The efficiency of the day worker means much. It is unfortunate to confuse the two.

To do so is to covertly suggest that the companies had no right to protest against the reduction in hours. That they had a right to ask the public to compensate them is proved by the outcome, but the right compensation for increased day-labor charges, if Brissenden's figures are authentic, would have been more accurately figured at 3 than at 11 per cent. The figure Brissenden evolves out of his partisan bias would seem to show that the coal companies should, when the day was set at eight hours, have figured their day-labor charges 1.4 per cent. lower instead of increasing them 3 per cent., as was necessary.

However, a slightly different result is obtained by using the figures of the Pennsylvania Department of Labor. These figures show that there was a decrease of 5 per cent. in the quantity of coal handled by men other

than miners and miners' laborers. Thus an 11 per cent. loss in time was accompanied by a 5 per cent. loss in productivity. That is an interesting result, but not nearly so remarkable as that deduced by Brissenden. Tables relative to the output and its handling will be found on p. 413.

An Easy Way To Help Uncle Sam

AN INTERESTING proclamation, recently issued by Governor Whitman to the people of New York State, points out to the rest of the country an easy way of helping conserve the man-power of the United States.

Stating that men are needed for productive labor, the Governor goes on to say that by carrying parcels home from the stores whenever possible; by accepting without complaint less prompt deliveries in war time; by not demanding special deliveries; by avoiding having goods sent home unless they are going to be kept, and by carrying back to the stores such goods as are portable when return cannot be avoided, dealers will be able to supply men for productive fields instead of withdrawing them therefrom.

The needless delivery work put upon stores, says the proclamation, means an unnecessary drain on the country's labor resources. It is obvious that the communication was addressed particularly to the women of the Empire State, but nevertheless it is equally pertinent to men and women the country over. The residents of coal-mining cities surely will not be backward in adopting the suggestions embodied in the foregoing.

Liberty Bonds and Taxes

LIBERTY BONDS are a form of permissive taxation. Those who feel the national need buy, and those who don't feel it put the money elsewhere. The support of the war, physical and financial, should be largely conscriptional and not optional. Taxes provide that feature. Great Britain gets \$800,000,000 per annum out of excess profits. We could get far more from such an excess-profits tax, and still more if we would tax every profit, wherever it is made.

According to Ford's statement to the Industrial Relations Commission, his factory made about \$25,000,000 in one year. An 80 per cent. tax would pay about \$20,000,000, and really a pleasure-vehicle factory has no more right to claim exemption than the industrial concern which makes war material. It does not do as much to aid in the war; it has had several years of profit instead of a few, and it has several years to look forward to. So why should it not donate its share as much as those factories whose business starved till the war began, whose business will starve as soon as it is over, and without whose assistance the war could not be conducted?

The Oct. 13 issue of *Coal Age* is the annual "Safety, Welfare and First-Aid Number." All readers of *Coal Age* are invited to contribute articles on subjects dealing with any or all of these vital topics.

Department of Human Interest

Big Safety Meet in New York



ON SEPT. 10, at the Hotel Astor, New York City, and lasting to Sept. 14, will be held the Sixth Annual Safety Congress of the National Safety Council. The meeting at Detroit a year ago was attended by over 2100 persons. It is not likely that less will attend in New York City, for there have been 1173 new members added during the year. There are now 3293 members having over 15,400 representatives and employing 4,500,000 workmen.

The income from dues has been about \$77,000 for the year just passed. There is a balance after all bills are paid of about \$7000. Last year about 5,000,000 bulletins were distributed. There are 150 members in nine foreign countries who are receiving and posting bulletins. Eleven local councils have been organized or reorganized during the year as well as two state councils. There are now 33 of these state and local subsidiary organizations.

The number of mining companies that are members is constantly increasing. There were at least 230 companies in the list on Aug. 1 of this year. As the cost of corporate membership runs annually from \$10 to \$100, it is easy to see that affiliation represents not a passing but a real interest in the work, purposes and bulletins of the association.

The report of the general manager says:

When the United States entered the war, your officers and executive committee immediately offered the services of the council to the Council for National Defense. Your President, L. R. Palmer, has made dozens of trips to Washington, and has taken the leadership in preparing plans for assisting the Government in supervising the safety of workmen in its plants during the war. Out of these activities there came a request from the United States Employees Compensation Commission for skilled aid in directing and supervising safety surveys in all of the Government navy yards and arsenals. Mr. Price entered the commission's service May 15 for this purpose and expects to complete his work within a few weeks. Too much praise cannot be given to members who met every request for supplying, free of expense to the Government, the services of their engineers and assistants to make these surveys, and demonstrate to the Army and Navy Departments that organized safety work must be established in all their plants.

The proceedings of the council for 1916 comprised a volume of 1543 pages. Other publications have been put out by the Safe Practices Committee—"Ladders," "Stairs and Stairways," "Boiler Rooms," "Crane Construction and Safe Practices," "Belt Shifters and Belt Shippers" and "Knots, Bends, Hitches and Slings." Six other pamphlets are in preparation. A page of one of these publications is shown in the left-hand corner of the illustration on the opposing page.

Monday, Sept. 10, will be devoted to special committee meetings with a luncheon for all committees at 1 p.m. On Tuesday, Sept. 11, the annual meeting will be held

at which the general business of the council will be transacted. In the afternoon a round-table discussion on safety work in general will be led by A. H. Young, the director of the Museum of Safety, New York City. In the evening the mining section of the institute with, it is expected, the members of the American Institute of Mining Engineers, will hold an informal dinner at 6:30 at the Café Boulevard, Broadway and 41st St.; the cost per plate will be \$1.50. At 8:30 this will be followed by a smoker, to which entrance is free.

On Wednesday morning will be held the principal event of the meeting. William B. Wilson, the Secretary of Labor, will address all the sections. Dr. Charles P. Steinmetz, the well-known electrician and sociologist, will speak on "Economic and Social Value of Accident Prevention." M. A. Dow, general safety agent, New York Central Lines, will discuss "Progress and Possibilities of Accident Prevention Work."

Later on Wednesday the mining section will hold two sessions. At the morning meeting "Mine-Fire Prevention and Fighting" will be discussed by John Lloyd, the efficiency engineer of the Lehigh Valley Coal Co., Wilkes-Barre, Penn.; "Underground Mine Sanitation," by H. I. Young, manager, American Zinc, Lead and Smelting Co., Carterville, Mo.; "Visual Mine Safety Instructions," by E. E. Bach, mine-safety director, Ellsworth Collieries Co., Ellsworth, Penn.; "Hoisting Ropes," by H. H. Sigafos, general manager, Hazard Manufacturing Co., Wilkes-Barre, Penn.

MANY INTERESTING PAPERS TO BE READ

On Thursday the following papers will be read: "What Each Operator Can Do To Aid Accident Statistics," by A. H. Fay, mine statistician, United States Bureau of Mines, Washington, D. C.; "The Equipment and Organization of Mine Rescue Stations," by A. J. Moorshead, president and general manager, Madison Coal Corporation, Chicago, Ill.; "The Mine Rescue Car of the Government," by D. J. Parker, mining engineer United States Bureau of Mines, Pittsburgh, Penn.; "Status of Oxygen Rescue Apparatus and Physiological Effects on Users," by J. W. Paul, mining engineer, United States Bureau of Mines, Pittsburgh, Penn.

In the afternoon George Deike, Mine Safety Appliances Co., Pittsburgh, Penn., will discuss "Advantages in Use of Permissible Electric Lamps in Nongaseous Mines"; a paper will follow on "Safety Precautions in the Installation of Electrical Apparatus in Mines"; Carl Scholz, consulting mining engineer for the Chicago, Burlington & Quincy R.R., Chicago, Ill., will lead a discussion on standardization of mine cars in coal mines with special reference to couplings, bumpers and brakes, wheel base, gage, clearance at ends and sides and projections to catch clothes; Prof. R. M. Raymond, of the Mining Department, Schools of Science, Columbia University, New York City, will discuss the same problem with regard to metal mines; George S. Rice, chief min-

ing engineer of the Bureau of Mines, will follow with a paper on the "Necessity of Mechanically Produced Ventilation for Metal Mines."

This will close the program for the mining section. It would be futile to give an account of the other sections, but it is equally a mistake to overlook them for

titioner in the United States to lower the electric death rate. By the way, Ida M. Tarbell will discuss "Health for Every Man" on Wednesday in the Health Section.

A National Exposition of Safety and Sanitation will be held at the Grand Central Palace Sept. 10 to 15. In this event the American Museum of Safety, which holds

Mining Sectional Series

Bulletins Are Read by 3,500,000 Workmen Each Week

NATIONAL SAFETY COUNCIL, CHICAGO, ILL.

Driver Caught Between Gob and Car

Before the Accident the

Road Looked Like This

After the Accident the Road Looked Like This

If the Boss Don't Know the Conditions, Show Him

Prepared by and issued under the auspices of the Mining Section
Additional copies of this Bulletin can be secured at cost price from the National Safety Council, 200 North LaSalle St., Chicago, ILL.

Mine Worker Killed

How? Like This

Safe Way to Couple Cars

Prepared by and issued under the auspices of the Mining Section
Additional copies of this Bulletin can be secured at cost price from the National Safety Council, 200 North LaSalle St., Chicago, ILL.

they have much interest to the coal man. The Health Service section is especially interesting to the physicians of coal companies. "Low Voltage Hazards" in the Iron and Steel Sectional Meeting, Sept. 14, is exceptionally valuable, being presented by Dr. C. A. Lauffer, of the medical department of the Westinghouse Electric and Manufacturing Co., of East Pittsburgh, who has done perhaps more than any other medical prac-

a yearly exhibit, will be enabled to receive this year the effective collaboration of the National Safety Council.

One of the four grouped illustrations on this page has already been referred to. The other three are bulletins such as the company is distributing on mining risks, general safety, health and public duty. The motif of the illustration in the initial letter is taken from the front cover of the program of the council.

Discussion by Readers

Working Contiguous Pitching Seams

Letter No. 5—In a mine where I am working we had to face practically the same proposition as that described by Joseph D. Lewis, *Coal Age*, May 26, p. 930, except that the seam had an inclination of from 80 to 90 deg., instead of from 60 to 75 deg., as in Mr. Lewis' case. I would like to describe briefly the method by which we worked these two seams. It is as follows:

A tunnel was driven in to the bottom seam and gangways opened, to the right and left of this tunnel, in that seam. Chutes 10 ft. wide were driven up from the gangway for a distance of 30 ft. in the seam and a strong battery built over the gangway, in the mouth of each chute. At the head of the chute, 30 ft. up the pitch, crosscuts were driven connecting the chutes.

From these crosscuts new chutes were started a little to one side of the chutes below and driven up the same width, for a distance of about 200 ft., crosscuts being

and the coal and slate blasted out together and sent down the chute to the first crosscut above the gangway, where the rock and coal are separated and sent down separate boxes or chutes and loaded into separate cars on the gangway.

The work is wholly retreating. It is started at the inby end of the top crosscut and the coal and slate are stopeed out. At each blast the miner retreats through the crosscut under the solid coal. At no time is he exposed to any danger from the falling roof, except when shooting the last hole in a block or pillar, which requires a little care to avoid the danger of a free fall of coal and roof. Only the best and most experienced miners should be employed for that work.

Each pillar of coal is shot out in the manner described and in the order marked in the figure, beginning at the uppermost pillar in the first section inby. In the figure this first pillar is shown as worked out, and work is in progress in the second pillar, or the one next below. When one or more pillars have been removed in this manner, the roof will start to collapse, soon blocking itself, the refuse acting as a packwall.

Mocanaqua, Penn.

FREAS SMITH.

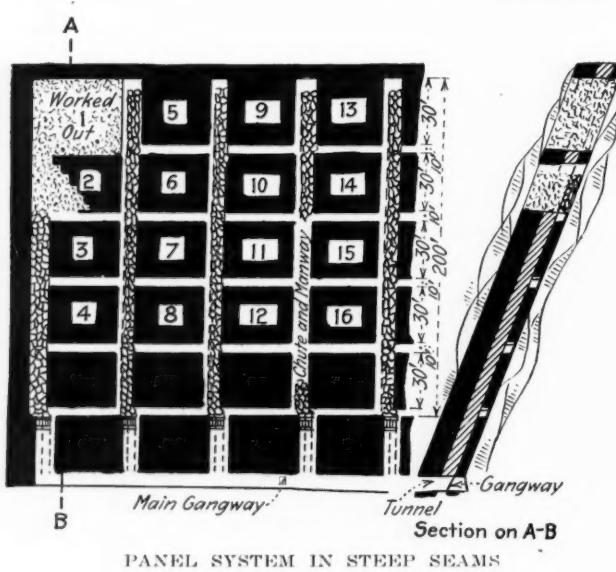
Mine Foremen and the Wage Increase

Letter No. 2—The experience of a mine foreman in eastern Ohio, as described in his letter, *Coal Age*, July 28, p. 168, is common to most men filling that position. As he has stated, the duties of the mine foreman, by reason of his office, are not always pleasant and his services not as fully appreciated as they deserve by the company that employs him. An instance in my own experience fully confirms this statement. Let me rehearse the circumstances briefly.

Today was statement day at the mine of which I have charge, and the fact that many of the statements showed a number of the men working by the day were drawing more money than that credited in my own statement was not comforting, especially when I knew that my own service involved greater responsibility and longer hours than any of the men in my employ. This occurrence is of such frequency, however, that it has failed to excite any comment on the part of the management, which is prone to regard it as a matter of course.

One statement that particularly attracted my attention was that of my assistant, who was credited with overtime so that his month's pay was in excess of my own. The assistant foreman, at this mine, is paid by the day and credited with overtime, while the foreman is paid by the month and given no credit for the extra hours he works, which are numerous and would increase his credit, in many instances, 40 or 50 per cent., if allowed.

While the assistant foreman can work overtime or not, as he feels disposed, the time of the mine foreman



is in demand any hour of the day or night. He is expected to be on hand when called if anything goes wrong at the mine—a steam pipe bursts; a pump refuses to act; the water supply is scarce or fails entirely; a man is hurt in the mine; or a thousand other similar occurrences will require the attention of the mine foreman.

If a pumper has imbibed too freely during the day and fails to show up on the 11 p.m. turn, the mine foreman is called out of bed to find a substitute. A not altogether amusing feature of this performance is the necessity of braving watch dogs at that hour of the night. Oh, how I love a foreigner's dog; he cannot understand a word I say, but his low, fierce growl warns me to keep at a good distance. One is fairly safe if he is in a buggy; and I have, at times, procured a horse and buggy at my own expense, for this reason.

WHAT DISCOURAGES GOOD FOREMEN

No one but the busy foreman who has experienced these trials and difficulties knows what the hardships of the position involve. Can anyone blame me for feeling discomfited on discovering that my assistant was paid a higher wage, knowing that he had less responsibility and worked only when he was so disposed?

Speaking of favoritism, this assistant had a pull, which he thought would exempt him from being discharged. It became my duty, however, in loyalty to the company, to warn him that he would have to do better or lose his job. I wanted to give the man every chance possible; but, under the circumstances, it is not strange that my warnings were disregarded and the inevitable came, much to the surprise of the man himself.

It is such instances as these that discourage the best mine foremen. The work truly is difficult. In our mine there are 22 pumps supplying 10 boilers, and a force of three firemen and seven pumpers is required on each turn of three shifts. It would greatly relieve the situation if the assistant foreman was made to fulfill the duties of an assistant, instead of being employed more as a dayman, in which capacity he assumes none of the burdens of the foreman and renders him little assistance, it may be, in his hour of greatest need. In view of the many difficulties that assail the mine foreman, he may well be discomfited by the fact that men in his employ draw bigger pay, for less work, than himself.

EXPERIENCE.

—, Penn.

Canvas in Ventilating Mines

Letter No. 1—I notice that a correspondent, in writing on "Extinguishing Fire in a Gassy Mine," *Coal Age*, Aug. 4, p. 208, condemns the use of canvas for directing the ventilating current in mines. Until I read the letter of W. H. Noone, on the same page, I could not understand how there could be any objection to the use of canvas for this purpose. Mr. Noone calls attention to the danger of the canvas taking fire, which is probably the ground on which the other correspondent objects to its use except in cases of actual necessity.

Having worked in mines where the gas given off, per ton of coal mined, is equal to anything so far recorded in mining practice, let me say a word in favor

of the use of fireproof canvas, as I have found this to give very satisfactory results, at a considerably reduced cost.

Several years ago I worked in a mine where 17 men lost their lives and much damage resulted to the mine, through the use of canvas that was not fireproof. As a result of this disaster and the agitation it aroused, the following clause was added to the Coal Mines Regulation Act, in this province:

Every place shall be bratticed up to within 4 yd. of the face and where open lights or explosives are used, or where electricity is used for power or lighting purposes, all brattice cloth or canvas and ventilating curtains shall be made fireproof.

As a measure of safety in mines, the adoption of such a regulation as this, by our friends in the States, would go a long way toward eliminating the danger of fires in their mines. Without a question, this is a matter that should appeal strongly to every coal-mine operator and worker alike. W. H. MOORE, Secy.,

The Vancouver Island Mine Safety Association.
Nanaimo, B. C., Canada.

Favoritism vs. Discipline

Letter No. 3—The many letters appearing in *Coal Age* and bearing on favoritism in relation to discipline and promotion seem to have ignored the necessary element of "getalongableness," the lack of which is so often the cause of men failing to work in harmony in overcoming difficulties.

Individuals have their peculiarities and a distinct manner of approaching the same problem, which may cause them to differ materially in the means and methods they employ to reach the same conclusion. The question presented will always be, Was there a saving in the expenditure of time and energy?

GOOD FELLOWSHIP MAINTAINS DISCIPLINE

Practical discipline that can be maintained under the present order of things, in mining as in other undertakings, is reached through good fellowship and coöperation. This should begin with the officials and bosses in charge. All grumblers and sulkers should be given a little friendly advice for their own good and that of the organization. Sometimes, however, prompt dismissal is the only wise and proper course to be taken with one who does not manifest a willingness to coöperate.

The discipline of any branch of an operation is built on the individuality and personality of the boss, and it is absolutely necessary for all to work in harmony with his ideas. This does not prevent a worker or underboss from offering suggestions on different features of the work in which he is engaged or which he is expected to perform, never forgetting, however, that the boss is the one who is responsible for the undertaking and that his orders are final and must be obeyed.

A COMMON WEAKNESS AMONG MEN

There seems to be an almost universal weakness among men that leads them to find fault and criticize the man who displays initiative, and those who have the least ability to perform are usually the first to explain how a thing should have been done after one or more attempts have resulted in failure. Among such there is seldom one strong enough to put his theories to the test and so prove them to be correct.

In order to accomplish results in any undertaking, then, it is necessary that there be a certain amount of good feeling and perfect understanding in regard to all matters of importance. There is no place in any organization for a person, high or low, that cannot be disciplined so that he will thereafter work for the best interest of the team. For this reason it is not uncommon to find an assistant failing of promotion, not because of his lack of knowledge and general ability, or through supposed favoritism, but by reason of his failure to be congenial in his business relations with his superiors. Too often it has become necessary to go outside of the entire organization in order to find a man fitted to fill a place of importance, simply because of a lack of harmony between the possible candidates and their superiors in office. Congeniality with some ability usually wins over much ability and a natural peevishness.

South Brownsville, Penn. G. E. DAUGHERTY.

Coal Production and Booze

Letter No. 1—I have followed with interest the letters, in *Coal Age*, relating to the falling off in the production of coal and ascribing different reasons for this condition. Much has been said about the shortage of labor being responsible to a large extent for the decrease in the output of the mines. Others claim that there is an acute shortage of cars, and this, by preventing the shipment of the coal mined, is the principal reason for the falling off in the daily tonnage.

While there can be no question that each of these causes contributes its share toward creating the present condition, I fully believe that the chief factor and probably the greatest hindrance in the production of coal is the drink habit that prevails so largely among mine workers. It would seem that intoxication is on the increase in many mining localities.

Most coal-mining companies have begun to realize the seriousness of the situation and the ruinous effect of the saloon in a mining town or camp. In the last quarter of a century there has been a vast decline in the morale of mining towns, and it will generally be conceded that the growth of the liquor business is responsible for this condition.

COUNTERACTING THE INFLUENCES OF THE SALOON

In a number of instances coal companies have striven to overcome this evil and raise the standard of living in mining districts, by creating a social environment that would draw around the mine a better class of employees. These efforts have met with some success in places, while little effect has been produced in other localities.

I recall, at present, an instance where the operator of a mine employing about 150 men spent hundreds of dollars each year, for the sole purpose of making his employees more comfortable and their social life more enjoyable. This effort and expenditure of means have been of little avail, however, since every week a brewery wagon, drawn by a fine team of horses, is driven into town. At times the wagon is loaded to such an extent as to require a double team.

The vile load transported is distributed among the saloons of the town, and it is easy to imagine the class of men that congregate in those places to spend the

money that should go to the support of their families. They are better described as a lot of hogs, whose craving for liquor has destroyed their manhood and brought them to a level lower than the beast. They are a disgrace to their families and the town in which they live.

It cannot be expected that such a class of workers will possess any spirit of patriotism, or have a desire to do their share in the present war crisis. They cannot be made to understand that a week's absence from their working places is an unpatriotic act and a hindrance to the prosecution of the war, on which the future of this and other countries depends.

It is to be hoped that the day is not far hence when the manufacture and sale of intoxicating liquors will be forbidden by Federal law, as being a menace to the prosperity of the country and the welfare of its people. When this condition is realized a better class of workers will be found in our mines. Homes will be made more comfortable and the people who occupy them happier. Such an enactment is more than ever needful at the present time. It is the one great means of insuring a maximum production of coal and making the miner realize the important part he must perform in the great national undertaking.

JUSTUS.

Myersdale, Penn.

Mine-Car Friction

Letter No. 1—In his article "Determining Mine Car Friction," *Coal Age*, Aug. 11, p. 229, N. G. Near gives a chart that will no doubt show the saving in horsepower, under a certain condition, effected by substituting roller bearings for plain bearings, on mine cars; but the condition must always be determined by tests.

If the mine electrician or mine superintendent were to suggest to the mine manager or president the saving in horsepower that would be effected by making this change in equipment, he would no doubt be asked at once to explain what he meant and to show the saving in kilowatt-hours per month, or more likely in cents per ton of output.

By way of illustrating his chart, Mr. Near gives an instance in which he says that the horsepower saved is 6.1; but he does not show the value of this saving at the power house. To make my meaning clear, let me say that the value 6.1 hp. is the value at the locomotive drawbar. Now, when the mechanical and electrical losses of the locomotive are taken into account, the value 6.1 will increase to, perhaps, 9 hp., which would represent the input to the locomotive from the trolley wire.

Again, the losses in the transmission system, from the substation to the locomotive, will be such that a value of 9 hp. delivered will be increased to, say 12 hp. at the substation, in average mining practice. Finally, if power is purchased, this 12 hp. will grow to 15 hp. that the company must pay for. If the mine produces its own power, practically the same amount will be required of the steam engine driving the generator in the power plant. But even this 15 hp. is of very little value, unless we know for how long it is required during the day, or the average number of working days per month.

The saving in the use of roller bearings is very much greater in a mine where the tracks are level. In most

mines, however, the coal must be hauled on a grade, and it would then be necessary to make a test over the entire system, in order to estimate with any degree of accuracy the saving to be effected by a change in the equipment. From this test it would be possible to calculate the value of the saving in the power system, expressed in kilowatt hours. The mine manager can then decide whether this saving will exceed the fixed charges on the increased cost of the new installation.

Let me suggest, here, that the test should not be taken on a new roller bearing, as a basis for estimating the saving that will result in the daily operation of a mine. I have tested roller bearings that had been in use for about two years and which had a friction greater than that of ordinary sleeve bearings. There are roller bearings on the market that, no doubt, if properly cared for, will maintain the low initial friction over a period of several years. Unfortunately, however, there are other bearings that will not show the same result, under the ordinary care that a mine car receives, in general service.

In order to make a proper comparison, the test should be made on bearings that have been in use for at least two years. Such a test will insure that the customer will obtain a make of bearing that will stand up in service and give the economy estimated by the test. The chart shown by Mr. Near may be of interest to the average mine electrician, but is of very little use in determining the real value of roller-bearing equipment on mine cars.

GRAHAM BRIGHT,

Westinghouse Electric and Manufacturing Co.
East Pittsburgh, Penn.

Artificial Respiration

Letter No. 1—Replying to the question asked by Joseph A. Greaves, in regard to the best method to apply to induce artificial respiration, *Coal Age*, Aug. 11, p. 256, let me say that I agree with the suggestion made by Mr. Greaves that the conditions will generally determine what method of treatment should be used, in different cases. Opinions will no doubt differ in this respect.

Speaking from my own personal experience, I prefer to use the Sylvester method in all cases where the person has been overcome with gas or rendered unconscious by an electric shock or by a blow on the head. On the other hand, I would much prefer to use the Schaefer method in a case of drowning where it is important to free the lungs of the water that has been imbibed. I believe that the Schaefer method affords a better chance to expel the water from the system than any other means that has been suggested.

My practice has been, in such a case, to first cleanse the mouth of any mud and see that the tongue is pulled forward. Then, grasping the body around the waist, with the face down, raise and lower it several times, which tends to drive out the water. I follow this operation immediately by applying the Schaefer method to induce respiration and get air into the lungs.

In the study of artificial respiration, however, it is important to become acquainted with all the known methods, so that any of these can be applied, as the judgment may dictate. The operator must always consider carefully the nature of the patient's injuries and

apply that method which he considers will produce the quickest and surest results.

The American Mine Safety Association, in 1915, after repeated experiments with subjects, recommended the adoption of the Schaefer method in all cases where the conditions did not prohibit its use. Prominent on this committee were Dr. Yandell Henderson, of Yale; Doctor Cannon, of Harvard; Dr. George W. Crele, of Cleveland, and other well-known physicians.

The aim and endeavor of the committee was to find out the best methods of resuscitation, as determined by the following considerations: (1) Producing the largest amount of air, in inspiration and expiration, in the shortest time. (2) Causing the least amount of injury to the person. (3) Causing the least fatigue to the operator, so that the work can be continued without cessation the greatest length of time. The conclusions of the committee were based on these three counts.

Uniontown, Penn.

JOHN T. BRADLEY.

Preventing Mine Accidents

Letter No. 11—It seems hard to convince the average mine worker, and particularly the younger man, that his safety depends upon his own care and self-preservation. Men are generally thoughtless of their surroundings and seldom stop to consider what they are about to do, unmindful of the fact that a hasty act may cost them their lives. Some mine accidents that have resulted fatally can almost be classed as suicidal.

Not long ago, several men were being hoisted on a cage in a deep shaft. One of them was idly kicking at the curbing of the shaft. Being cautioned and told to desist, he made one last kick, in play, which resulted in his foot being caught between the cage and the curbing, and he was quickly thrown to the bottom of the shaft. Picked up, a little later, he was rushed to the hospital where he died a few hours later.

Another instance is that of a driver who was cautioned many times not to ride on the front end of his trip when coming down a heavy grade. He was told that should one of his sprags break or become loosened the heavy trip of loaded cars would rush the mules and he would stand a good chance of being knocked off and run over. Notwithstanding this caution, he persisted in his practice and what was predicted happened. The poor fellow now lies under the sod.

Another, a miner indifferent to danger, was told that he was working under a loose piece of slate and ordered to stop his work and make it secure. Instead of doing this, he continued to dig coal and, shortly after, was caught by the fall and killed. He, too, lies under the sod.

Another, a triprunner, was instructed not to ride his trip, as he was prone to do, where the cars bumped badly, on descending a big hill. Failing to take the advice offered, this man also is the victim of his own recklessness and, like the others, now lies under the sod.

These are a few examples of the careless, "know it all," who are too proud to take advice or listen to a word of caution. Many a time my blood has boiled and I have been inclined to use a sprag on a man's thinker to arouse him to a consciousness of the risk he assumes.

I recall the old days, when, working as a pony boy in the mine, it was the custom to report to the boss any-

thing that was done in violation of the rules. The boss was often a kind of bully and, without ceremony, would administer his yard wand until the guilty one was black and blue, and then send him to his work. While that method would seem barbarous, it worked well, and might be used today, in some cases, with good effect.

The prevention of accidents depends on the frequency of the visits of mine officials—the mine foremen, assistant foremen and firebosses. These men should alternate their visits in such a manner that every working place will be carefully supervised at frequent intervals. Everything will depend on the ability and foresight of the officials charged with the duty of looking after the safety of their men.

R. W. LIGHTBURN.

West Leisenring, Penn.

Uncertificated Mine Foremen

Letter No. 6—The question raised by "Kentucky," *Coal Age*, June 2, p. 970, in regard to the employment of uncertificated men to take the places of certified mine foremen who might be called to the colors, appeals to me as one that need cause no great concern. In my opinion, few certified men will be called away from their duties at the mines and sent to the front. As mine foremen, they can perform a far greater service to their country by remaining where they are, because of the necessity that the output of coal from the mines shall not be hampered.

As far as the mines in this state are concerned, the mining law of Tennessee, in requiring the certification of mine foremen, specifies (sec. 15), "No coal or other mine shall be operated for a period longer than 30 days without such certificated mine foremen." The same section further provides that a fine of \$25 a day shall be imposed on the owner, operator or superintendent of any mine for each day the mine is operated without the employment of a certified foreman.

GREATER SAFETY IN THE EMPLOYMENT OF CERTIFIED MINE FOREMEN

While it must be allowed that there are many men who hold no certificate of qualification but who are more competent to act as mine foremen than some others who hold such certificates, my opinion is that greater safety is guaranteed where the mining law requires every foreman to hold a certificate. It cannot be denied that such a law stimulates the study of mining, and no man can make a truly efficient mine foreman without a knowledge of the theory of mining.

Mine safety requires that every manager, superintendent, foreman, assistant foreman and fireboss should possess both practical experience gained by years of work in the mines and a theoretical knowledge gained by the study of mining textbooks. I think it is true that there are more efficient mine officials to be found among those who hold certificates than among those who have never passed an examination and have little knowledge of the theory of mining, whatever may have been their practical experience.

The remark often made, "He is a good practical man," is generally based on the fact that the one referred to has mined coal all his life. In my opinion, the man who has done nothing else but dig coal at the face is the one least qualified to direct the working of a mine.

On the other hand, the mine foreman best qualified for the position is the one who has performed every class of work required in the mine, and who, by study, has a knowledge of the theory of mining that will enable him to understand the principles of ventilation, drainage, timbering, tracklaying and haulage. Such a one is far more competent to act as mine foreman than one who has never interested himself in matters beyond the blasting and loading of coal.

U. S. WILSON.

Briceville, Tenn.

Valuation of Coal Lands

Letter No. 2—In connection with the interesting discussion on the valuation of coal lands, kindly permit me to present a method that I have employed with much satisfaction in estimating the tonnage of coal extracted, in the working of leasehold areas.

It was necessary that the estimated tonnage, calculated from the mine plan, should correspond closely with the actual tonnage sheet. It was not uncommon for my estimate to come within 200 tons of the actual tonnage reported for a run of six months. It will be readily realized, however, that this close correspondence depended not only on an intimate knowledge of the underground workings, but on the accuracy of the surveys and plans. A planimeter was used in estimating the area worked out in the plan.

Having determined the area worked out since the last estimate was made, it was my practice to assume an extraction of 126 long tons per inch-acre and base my calculations on that figure. In applying this rule, it was only necessary to multiply 126 by the thickness of the seam in inches and that product by the estimated area expressed in acres.

The rule assumes that the difference between the results obtained and those found by following the method suggested by C. McManiman, in his letter, *Coal Age*, Aug. 4, p. 210, is more than counterbalanced by the allowance that must be made for unworkable coal and that lost in extraction. These allowances will vary considerably with the experience and judgment of the one making the estimate. It has been found that a coal having a specific gravity of, say 1.25, will average about 126 tons per inch-acre in the mining of the seam, and this fact forms the basis of the method I have employed.

According to Prof. E. E. Somermeier, of the Ohio State University, the specific gravity of American coals (bituminous) ranges from 1.27 to 1.32. These figures seem rather higher than the observed specific gravity of British coals, on which my rule is presumably founded. It would be interesting to know if this is actually the case.

J. F. K. BROWN.

Montreal, Canada.
[The specific gravity of American bituminous coal ranges from 1.2 to 1.5. The average specific gravity of this coal is usually assumed as 1.3 ("Mine Gases and Ventilation," page 30). The simplest rule for estimating tonnage per acre is that given in the reply to this inquiry on the "Valuation of Coal Lands," *Coal Age*, June 2, p. 970, where it is stated that 100 times the specific gravity of the coal gives the available short tonnage per inch-acre, allowing for a loss, in mining, slightly exceeding 10 per cent.—Editor.]

Inquiries of General Interest

Increase of Circulation Due to Enlargement of Airway

Kindly explain the method of calculating how much the circulation of air will be increased by the partial enlargement of the airway in the following question:

An air current of 10,000 cu.ft. of air per minute is passing through an airway 3x3 ft. in section and 1050 ft. long. It is decided to enlarge the section of this airway by making it 6x6 ft. so as to furnish more air. The work of enlarging the area starts at both ends of the airway and continues until about 50 ft. remains to be completed, when the work of enlargement stops. (a) What will be the increase in ventilation, assuming the pressure remains the same? (b) What will be the increase in ventilation, the power remaining the same?

If the work of enlarging the airway had been completed, the question of how much the circulation would be increased, under the same pressure or the same power, would be comparatively simple. I have been unable to find a similar question in my textbooks and would like to have the method of solving such an example clearly explained.

STUDENT.

Springfield, Ill.

It is only necessary in this case to calculate the potential factor for the entire airway before the change was made and for each section after the airway was partly enlarged. This potential factor is expressed by the rubbing surface divided by the cube of the sectional area. Multiplying this potential factor by the square of the quantity gives the unit pressure. Also, multiplying the same potential factor by the cube of the quantity gives the power on the air, and we write

$$\frac{sQ^2}{a^3} = Q^2 \left(\frac{s_2}{a_2^3} + \frac{s_1}{a_1^3} \right)$$

In this formula Q_1 = original circulation; Q_2 = increased circulation; a_1 = original sectional area, 9 sq.ft.; a_2 = enlarged area, 36 sq.ft.; s = original rubbing surface of airway, 12,600 sq.ft.; s_2 = rubbing surface of enlarged portion of airway, 24,000 sq.ft.; s_1 = rubbing surface of unchanged section, 50 ft. long, 600 sq.ft. Solving with respect to Q_2 and simplifying, we have for the increased circulation, in this case,

$$Q_2 = Q_1 \sqrt{\frac{s}{\left(\frac{a_1}{a_2}\right)^3 s_2 + s_1}}$$

Substituting the values in this formula, we have, for the increased circulation, when the airway has been partly enlarged,

$$Q_2 = 10,000 \sqrt{\frac{12,600}{\frac{24,000}{64} + 600}} = 35,950 \text{ cu.ft. per min.}$$

When the power remains the same after the change as before, the same formula is applied, except that the

cube root is extracted instead of the square root, which gives,

$$Q_2 = 10,000 \sqrt[3]{\frac{12,600}{\frac{24,000}{64} + 600}} = 23,460 \text{ cu.ft. per min.}$$

This question is not a common question in mining textbooks on ventilation, although it has a very practical application in the development of a mine.

Range of Anemometer Readings

I would like to ask, through the columns of *Coal Age*, what is the least amount of air that can be recorded by a pocket anemometer, in an airway 38 sq.ft. in area?

—, Ala.

ASSISTANT FOREMAN.

There is a considerable difference in the delicacy of different types of anemometers, as well as in different instruments of the same type. The least velocity that the instrument will record depends both on its size and on the delicacy of its mechanism. For example, a 6-in. Biram anemometer, in good condition, should record a lower velocity of air than a 3-in. pocket anemometer of the same type. The pocket instrument, after a certain period of use, is apt to have its delicacy impaired by the wear and jar to which it is exposed while being carried about on the person. The smaller size of the instrument, also, does not present the same freedom of movement, as the surface of the vane is smaller and its setting in the case hampers the flow of the air to a much greater degree than is the case with the larger instrument.

For these reasons, it is impossible to state with any accuracy what is the least velocity of air that would be recorded by an instrument of the pocket type. It is possible that a new instrument of this type will record a velocity of 250 ft. per min., which, in an airway having an area of 38 sq.ft., would indicate a volume of air passing of $38 \times 250 = 9500$ cu.ft. per minute.

A 6-in. Biram anemometer in good condition may indicate velocities ranging from 180 to about 2000 ft. per min. A velocity of less than 180 ft. per min. (3 ft. per sec.) will generally fail to produce a uniform movement of the vane of the instrument. On the other hand, when a Biram anemometer is exposed to velocities exceeding 2000 ft. per min., there is danger that the vane of the instrument and the delicate mechanism with which it is connected will be injured in a short time. For measuring these high velocities, the device known as the "Pitot tube" should be used. More accurate results are obtained by the use of the latter instrument, in any case, than is possible with the anemometer, whose readings at the best are only approximate.

The anemometer is usually calibrated to give a correct reading at a velocity of 500 ft. per min. For a lower velocity the reading must be increased, while for a velocity exceeding 500 ft. per min. the reading of the dial must be reduced. See *Coal Age*, Aug. 18, p. 296.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—In the case of an explosion of firedamp in which 8.4028 lb. of marsh gas is concerned, assuming that all of the hydrogen combines with the oxygen of the air to form water (H_2O), what weight of water vapor will result from this explosion?

Ans.—The chemical equation representing the reaction that takes place between the carbon and hydrogen forming the marsh gas in the firedamp mixture, and the oxygen of the air, is



Since the atomic weights of carbon, hydrogen and oxygen are C = 12, H = 1, O = 16, the molecular weight of marsh gas or methane (CH_4) is $12 + 4 \times 1 = 16$; and the weight of the two molecules of water vapor, formed as the result of this reaction, is $2(2 \times 1 + 16) = 36$. The ratio of the weight of water vapor formed to the weight of methane consumed is, therefore, 36:16, or 9:4. That is to say, the weight of water vapor formed is $9 \div 4 = 2\frac{1}{4}$ times the weight of methane burned. The total weight of water vapor formed by the burning of 8.4028 lb. of marsh gas or methane is, therefore, $2\frac{1}{4} \times 8.4028 = 18.9063$ lb.

Ques.—In an air-compressing engine cylinder, would you prefer to have much or little clearance at the end of the air cylinder? Give the reasons for your answer.

Ans.—In air compression, the clearance space, which includes, besides the clearance at the end of the cylinder, all the space in the air ducts up to the valve, should be as small as practicable. The reason is that, at the end of the stroke, this clearance space is filled with air at the delivery pressure. As the piston starts to make the following stroke, this air expands and occupies a portion of the air volume of the cylinder. The volume of free air handled each stroke, which should be equal to the piston displacement, is therefore reduced and the efficiency of the compressor impaired to that extent.

Ques.—What is the area of a road measuring 7 ft. 3 in., by 6 ft. 6 in. in cross-section?

Ans.—The sectional area of this road is $7.25 \times 6.5 = 47.125$ square feet.

Ques.—Explain the difference between ventilating pressure and absolute pressure.

Ans.—The term "ventilating pressure," in coal mining, should relate to the total pressure producing the circulation of air in the mine, which is the unit pressure expressed in pounds per square foot multiplied by the sectional area of the airway expressed in square feet. The term, however, is often used indifferently for the unit pressure, which is found by multiplying the inches of water gage by 5.2, since 1 in. of water gage indicates a pressure of 5.2 lb. per sq.ft. in the airway. The term "absolute pressure" is the gage pressure plus the atmospheric pressure, both being expressed in the same terms, as pounds per square foot or per square inch.

Ques.—A steam jet and a fan, both acting together on the air in an upcast shaft, produce 75,000 cu.ft. of air per minute. When the fan is stopped the jet produces 15,000 cu.ft. per min. What quantity of air would the fan give working alone?

Ans.—Whether these ventilating motors are working together or singly, each produces the same power on the air. But, for the same conditions in the mine, the quantity of air in circulation varies as the cube root of the power. Hence, it follows that the cube of the total quantity produced by both motors working together is equal to the sum of the cubes of the quantities produced by each motor working singly. Since the total quantity produced by both motors working together is 75,000 cu.ft. per min., and that produced by the steam jet working alone is 15,000 cu.ft. per min., calling the quantity of air produced by the fan working alone Q , we have

$$75,000^3 = 15,000^3 + Q^3$$

$$Q = \sqrt[3]{75,000^3 - 15,000^3} = \text{say } 74,500 \text{ cu.ft. per min.}$$

Ques.—What would be the variation of the meridian of a plane when the bearing of two objects thereon with its meridian is N 13° E, and the bearing of the same two objects on the surface is found, by an instrument whose needle has 19 deg. west variation, to be N 8° E?

Ans.—The meaning of this question is quite uncertain; but, assuming that the needle of the compass has a declination of 19 deg. W, and the bearing of the line joining the two objects, as found by this compass is N 8° E, its true bearing would be $19 - 8 = 11$ deg. to the west of the true north, or N 11° W.

Now, if the bearing of this line with the meridian of the plane is N 13° E, the true bearing of that meridian is $13 + 11 = 24$ deg. to the west of true north, or N 24° W.

Ques.—How do you determine the average speed of the piston of a hoisting engine when you know the length of the stroke, the average diameter of the drum, the depth of the shaft and the time of hoisting?

Ans.—Dividing the depth of the shaft, in feet, by the time of hoisting, in minutes, gives the speed of hoisting, in feet per minute. Then, multiply the diameter of the drum by 3.1416 to find its circumference and divide the speed of hoisting, in feet per minute, by the circumference of the drum, in feet, to find the revolutions per minute of the drum shaft. Finally, since the engine makes two strokes to each revolution of the drum, multiply twice the length of stroke in feet, by the number of revolutions of the drum per minute, to find the piston speed, in feet per minute.

Ques.—What is understood by the letters B.t.u., sometimes used in connection with electrical matters?

Ans.—These letters, which in steam engineering practice stand for British thermal units, are sometimes used in connection with electrical supplies as meaning "Board of Trade units."

Coal and Coke News

Harrisburg, Penn.

Officials of coal companies located in the fifteen counties that comprise the middle judicial exemption district, which takes in all the anthracite companies in the Wyoming, Lackawanna and Lehigh regions, appeared before the board of appeals on Aug. 30 and presented arguments for the exemption of employees in the service of the coal companies.

The principal argument advanced was that to take away one man from a certain department of the industry, as a miner, minister's laborer, locomotive runner, mule driver or runner would have a tendency to throw the whole industry out of place and thereby reduce to a great extent the production of coal.

Members of the appeal board let it be known from the start that they were against a general exemption of the employees, and finally, after several hours' deliberation, presented a plan to the coal officials that was unanimously accepted.

A. Mitchell Palmer, chairman of the board, made a suggestion that they withhold their requests for the exemption of employees until it was definitely ascertained from the local boards how many of the men certified were employed by the various coal companies.

The shortage of labor in the anthracite field was brought out forcibly at the meeting, as all the representatives of the respective coal companies declared they were working with a greatly reduced force, occasioned by the miners and laborers seeking employment in the munition centers.

At a conference on Aug. 31, the representatives of the coal-mining companies went more thoroughly into the discussion of the discharge of the drafted men engaged in the coal industry. At the conclusion of this meeting the appeal board announced that inasmuch as each local board certified to the district board its own quota of men, plus 10 per cent, it would assist the district card greatly if the coal companies would not ask for the discharge of more than 10 per cent. of the men in their employ actually called for service.

The representatives of the coal companies signified their willingness to cooperate with the district board and promised to reduce their claims for discharge to the minimum. The district board, however, was careful to reserve to itself the final right to determine which, if any of the men who claim discharge, should be released.

Coal shippers in the bituminous region assert that the priority shipment order, just put into effect in favor of Lake coal, is going to work a hardship upon manufacturing interests in the soft-coal regions, and possibly cause a curtailment in operations. Coal shippers have received copies of instructions issued to superintendents governing the distribution of cars to coal mines. These instructions require that full supplies of cars be given for the shipment of coal to the Lake ports, the instructions being based upon an order issued by authority of the President of the United States.

The shippers are allowed to indicate the number of cars they desire for loading Lake coal, at the same time stating the port to which they are to be moved. These cars are to be furnished in full, and if the number thus furnished equals or exceeds the number of cars the coal mines would receive under the usual distribution, then no additional cars will be placed.

The normal distribution of coal cars involves the setting for each day of a percentage of the whole railroad division, the percentage being computed by dividing the total number of cars available by the total of the car ratings of different shippers on the division.

Normally each mine is then given a number of cars equal to this same percentage, applied to its own car rating. Under the new order, a mine might receive its full quota for Lake shipments and no cars at all for ordinary commercial loading. It is stated that on Aug. 27 and 28 no cars for commercial loading were placed on the Monongahela division of the Pennsylvania R.R. and that the same conditions obtained on the other divisions.

It is claimed that it is to the interest of the majority of coal shippers to ship Lake coal in preference to coal for other destinations, because there are contracts in force, applying to Lake coal, at much higher prices than the price at which coal can be sold in the open market under President Wilson's order.

Coal shippers positively assert that the operation of the priority order in connection with Lake coal would, within a very short time, produce a shortage of coal at many manufacturing plants, and that this would result in the manufacturers bringing pressure to bear upon Washington, looking to such modification of the order as would keep the industries in operation.

Many of the independent operators in the soft-coal field are not trying to market their coal, it is alleged, and do not intend to until they have to. The railroads have plenty of coal cars because many have to fill them and will be glad to do so, because of the contract prices being above the Government's figure, but the mines that depend on the open market are not inclined to seek a market of \$2 a ton. Railroad officials admit that there is not nearly the urgent demand for coal cars that there was before the Government fixed the \$2 rate, but the railroads are said to be unconcerned, believing the decrease in coal output will prove only temporary. Because of the restricted output a late demand for coal is said to be more urgent than ever. Some consumers will gladly pay premiums for coal, but the operators are afraid to accept bonuses.

A movement is on foot among the small operators in the central Pennsylvania district to send a delegation to Washington, placing before the President and Government authorities data regarding the cost of coal production. The conference also touched upon the matter of reducing the wages of employees in an effort to keep the mines going. Operators called attention to the fact that in the nonunion field the wages could be reduced with no violation of the scale agreement.

What Pennsylvania operators want to know from the coal administrator are the exact conditions and the price they are expected to meet. When this is known, they will, if possible, meet them. The operators do not want to antagonize the coal administrator. They want to work with him, but there are many points which must be cleared up.

PENNSYLVANIA

Anthracite

Hazleton—The Lehigh Valley Coal Co. has awarded the contract for a big striping at Gowen to the newly incorporated Benjamin-Schriener Construction Co. The job will last four years. The entire Gowen basin will be laid bare for the removal of fuel, which can be mined cheaper through surface methods than by running gangways from the main slope.

The A. S. Van Winkle Co., operating the Coleraine mines, is driving a new slope through which coal will be taken out from the smaller veins. The tonnage will be materially increased. There is sufficient coal in sight to keep the place in steady operation for the next 15 years or more, at the least.

Drifton—The collieries here are to make an extra effort to help meet the fuel demand, as the Lehigh Valley Coal Co.'s great culm banks are to be prepared for market. Large steam shovels have been installed.

Contractor W. J. Boyle has a large force of men laying a railroad siding for the East Point Coal Co. This is a new concern which is developing once abandoned mining operations in the north basin.

Beaver Meadow—After two miners had fired a blast in their chambers, they found a cow among the coal and rock brought down by the shot in the operation of the Lehigh Valley Coal Co. recently. The animal had been grazing in the brush on the surface, 100 or more feet above, and

came down with the débris unharmed. She was led out through a gangway.

The Evans Coal Co. is erecting a new breaker at Beaver Meadow and expects to be running coal through it for market within the next three months.

Edwardsville—Four mine workers of the Woodward colliery of the Delaware, Lackawanna & Western Railroad Co., narrowly escaped death on Aug. 30, when a mine cage from which they were about to alight at the head of the shaft dropped several hundred feet when the rope broke. The four men owe their lives to the proper working of the safety "dogs," which stopped the fall of the mine cage when about halfway down the shaft.

Bituminous

Butler—Announcement by the Government of its resolution to enforce \$2 coal prompted John C. Graham, who owns coal tracts of 700 acres in Clarion County, to call a meeting of his employees and outline the situation with a view of putting in force a lower wage scale. But, says Mr. Graham, the suggestion was not applauded. Upon which he offered to let the men run his mines themselves and pay him a nominal profit. This also was not favorably considered by the men, according to a statement made by Mr. Graham.

Johnstown—Unless there is a drop in the cost of labor and equipment, many coal mines, employing a few dozen to several hundred men, will be compelled to shut down as a result of the \$2-ton rate fixed for coal. Labor about the mines costs from \$3.30 to \$3.50 a day. Steel rails which formerly sold at \$25 a ton now cost mine operators \$100, and the price of everything else connected with mine operations is correspondingly higher.

Somerset—Ex-Congressman Henry D. Green, on behalf of himself and other stockholders and creditors of the Laurel Hill Valley Coal and Coke Co., had an injunction issued against the Laurel Hill Lumber Co. and the Laurel Hill Valley Coal Co. to prevent the transfer of 1777 acres of valuable coal land in Somerset, now the property of the coal and coke company, to the lumber company. The company paid \$5000 to prospect upon and develop the land, and Mr. Green says if the land is returned without any consideration the money of the stockholders will be lost. The land originally belonged to the Laurel Hill Lumber Co., and the deed is held by Mr. Green, pending completion of certain developments.

Connellsville—Titles to 12,000 acres of coal land in Cambria and Jackson townships, Cambria County, have been recorded in favor of the Pennsylvania Coal and Coke Co. The deal involves over \$2,000,000. The land was optioned 20 years ago at \$20 an acre. The selling price shows the value to have multiplied ten times in 20 years.

Monessen—Engineers are now at work laying out the site for the immense coal plant and the mining town planned by the Jamison Coal and Coke Co. on the Thaw tract, located between Manito and Pleasant Unity.

Washington—An extensive coal deal of much interest has just been completed by the McClane Mining Co., which has purchased the Rich Hill property, in Chartiers Township, adjoining the holdings of the McClane company at Meadowlands and Arden. The purchase was made from the United Coal Corporation, the consideration being kept private, although it is understood to have been at a high figure. Tipples are in operation at Rich Hill and a new one is being erected at the Mildred mine on the McClane farm. Considerable new equipment has been purchased and has been delivered. After the erection of the new tipple the company will make a daily production of between 3000 and 4000 tons.

Pittsburgh—Coal shippers assert that the priority shipment order, recently put into effect in favor of Lake coal, is going to work a hardship upon manufacturers in the Pittsburgh and valley districts, and

possibly cause them to curtail operations. Coal shippers have received copies of instructions issued to superintendents governing the distribution of cars to coal mines, these instructions requiring that full supplies of cars be given for the shipment of coal to the Lake ports, Cleveland, Ashland, Erie and Sandusky, the instructions being based upon Priority Order No. 1, issued by authority of the President of the United States, and General Order No. C S 4, issued by the Commission on Car Service.

Altoona—The operators in the thin vein district of Pennsylvania, which is situated on the eastern edge of the great bituminous field, are circulating a signed statement to the effect that the recent prices fixed by the Government for the State of Pennsylvania did not take into consideration their cost of mining this grade of coal, and that the President's prices are not equitable, as compared to other districts. A representative is to be sent to Washington to take the matter up with the coal administrator.

WEST VIRGINIA

Fairmont—The Braxton Splint Coal Co. which recently obtained a state charter, has leased a tract of 225 acres of the Pittsburgh vein of coal on the Coal & Coke R.R. at Delta, Braxton County, and is opening a mine plant there for the purpose of developing the tract on an extensive scale. The company has organized by T. W. Arnett, of Fairmont, president; C. W. Flesher, of Gassaway, secretary-treasurer, and J. B. Haught, of Elkins, vice president.

Morgantown—Organization of the Monongahela Valley Coal Operator's Association was announced recently at Morgantown, following a meeting of operators of that section in the Morgantown board of trade rooms. J. L. Keener is president; E. H. Gilbert, vice president; Nat C. Burdette, secretary; James H. McGrew, treasurer, and Raymond E. Kerr, R. M. Davis, S. D. Brady, H. C. Greer, B. M. Chapman and W. P. McCue, directors. The chief purpose of the association is to obtain a system of cost accounting and promote cooperation among producers, but it is stated there is no purpose to reach any agreement for a control of prices. Committees are to be sent before the Federal Trade Commission with regard to coal prices and to attend the meeting of the National Association of Coal Operators to be held at Pittsburgh in September.

Wellsburg—The coke works of the Belle Iron Works has been completed and coke is being daily sent across the new bridge to their tin plate mill. "Sulphur" and "benzol," two of the byproducts, are being manufactured daily, with a steadily increasing output. With the works all completed there remains an immense fill in the grounds to be leveled above the flood line. When the grounds are completely filled the water line will be about 20 ft. above the original level when the works were started.

Martinsburg—The unusual demand for coal has caused the smaller mines to take on a new lease of life. Special activity is noticeable along the old West Virginia central section of the Western Maryland system, which has with its major coal operations many small ones which in dull times have little market and are particularly at a standstill. Just now forty new houses for miners are nearing completion at Bayard, Grant County, W. Va., by the Emmons Mining Co., and will form the beginning of a new mining town. The company has a large force extending a water line to its property, and it will not be long before Bayard will have waterworks.

Clarksburg—Purchase of the Pennco mining plant at Lorentz, in Upshur County, by the Buckeye and West Virginia Coal Co., of Cleveland, Ohio, which operates plants in Pennsylvania, Ohio and West Virginia, was announced recently by officers of the company. The plant has been operated for some time by the Poole Townsend Coal Co. under lease, but the leasehold interests have been taken over from that company and the plant and coal tracts adjacent have been purchased outright. The purchase prices are not divulged. The purchasing company is shipping a large quantity of electrical equipment to the plant with the purpose of operating it entirely by electricity and enlarging its capacity. The coal tracts embrace about 300 acres of the Red Sone vein.

Spilman—Unknown persons entered the Spilman coal mine recently and destroyed the electrical apparatus, putting the mine out of commission. Two hundred miners were thrown out of employment as a result.

Wheeling—One of the largest coal cars ever constructed and the biggest ever seen in West Virginia passed over the Baltimore & Ohio road recently, loaded with 120 tons of West Virginia coal. The gondola is a mammoth car, being just four times as large as an ordinary 30-ton coal car generally used in transporting the black diamond. The car was constructed for the Virginia R.R. by the Virginia Bridge and Iron Co., of Roanoke, Va., and will be used for transporting coal from West Virginia and Virginia mines. It is said that a contract has been let for 500 of the mammoth cars. The car is of solid steel construction. It is 50 ft. in length and has a capacity of 218,000 lb. Many special features were included in the construction of the car to insure strength.

Charleston—The Public Service Commission has received a formal complaint from the Antler Coal Co. against the Monongahela Railway Co. The Antler Coal Co. requests that they be allowed to construct a switch and side track upon the right-of-way of the railway company at their mine at Round Bottom, Monongalia County, and to connect same with the railway of the defendant. They also petition that the defendant be compelled to cease to discriminate against the petitioner who is now unable to get out coal from a large and valuable seam.

Fairmont—The Monongahela Valley Tract Co. has let the contract to the Nicola Building Co., of Pittsburgh, for the construction of the addition to be erected to the joint power house of the Monongahela Valley Tract Co., and the Consolidation Coal Co. at Hutchinson. This contract covers the excavation work for the foundation for the building and construction of the foundations for the engines and the extension of the present building for the two immense gas engines of 1250 kw. each, which are to be installed by the first of January.

ALABAMA

Birmingham—Coal operators of the Birmingham district are preparing to "stand by the guns" in the matter of contracts made for coal before the president fixed prices on that commodity, stated Secretary James L. Davidson, of the Operators' Association, recently in a letter which he sent to members of the association. Mr. Davidson said that the operators propose to stand by the low price contracts they made prior to the fixing of prices by the president, and that they propose not to recognize cancellations by purchasers of coal whose contract prices are in excess of government prices.

KENTUCKY

Louisville—A committee of five was recently named at a special meeting of the West Kentucky Conservation Association, composed of coal operators in Western Kentucky, to make a protest, at Washington, against the prices fixed in the executive order on coal at the mines. This committee, which includes C. F. Richardson, vice president of the West Kentucky Coal Co., will report to the West Kentucky organization the result of its efforts at the capital. There were several statements to the effect that it would be necessary for some of the western Kentucky mines to shut down unless higher prices than those announced were permitted.

OHIO

Columbus—Expert accountants from the Federal Trade Commission at Washington will soon arrive in Columbus to cooperate with state accountants in checking up retail costs with a view of fixing retail prices in Ohio. The Ohio Clearance House will let the Federal authorities fix retail prices in the Buckeye State.

Attorney General McGhee reports that he has received a number of complaints from retailers that they cannot get coal at the reduced price fixed by Washington. Investigation shows that most of the operators have a large part of their output contracted for by Lake shippers or steam consumers and have very little for the domestic trade at this time.

The Hocking Valley Railway Co. has asked the Ohio Public Utilities Commission for authority to issue \$5,000,000 in 6 per cent. coupon notes to pay for and refund an issue of two-year 5 per cent. gold notes amounting to \$4,000,000, maturing Nov. 1, and also to provide funds for the acquisition of property and improvement of the service. The proposed gold notes would run for one year and mature Nov. 1, 1918. The issue is to be sold to the Equitable Trust Co. of New York for 98%. The hearing is set for Sept. 10.

Loud protests have arisen from owners of land in southeastern Ohio coal-mining counties against the newest methods of "stripping" entire hills with immense steam shovels in order to reach the coal veins. These protests have been made to the Ohio Defense Council. The mining committee of the council will consider the complaints at its next meeting. One of the complaints against the system is the coal stripping leaves the land of less value than that of the arid Western lands before irrigation.

The State Utilities Commission recently allowed to go into effect without affirmative action a 15c-a-ton increase on coal carried on Ohio railroads.

Investigation is being made by state officials on the closing of five eastern Ohio coal mines recently. There is a suspicion which seems to be well founded that pro-German sympathizers are at work in the district and have accomplished what they set out to do—close down the mines. Governor Cox refuses to discuss the matter further than saying that "it is certainly suspicious in view of the fact that the United Mine Workers' organization has nothing whatever to do with the trouble. We will have the facts within a few days and will act immediately upon them as soon as we are sure of our grounds." It is known that the State Defense Council is also making some rigid investigations for the Federal Government, and if one-half of the rumors which are heard are true, there may soon be some interesting developments in the matter.

INDIANA

Evansville—Evansville will have two municipal coal yards this winter when Mayor Bosse's new mine near Chandler is in full operation. It is on the Southern R.R., and the Evansville & Bonville traction line, and shipments will be made on both lines. The yards will be established at some point in the city on these lines, according to Manager Korff, of the municipal mine, and coal will be sold there at both wholesale and retail prices. The city is planning to contract with hauling concerns to make deliveries to consumers.

The Possum Ridge Coal Co., composed of local capitalists, which was recently organized with a capital stock of \$75,000, has taken over the Mitchem coal tipple and a lease on several hundred acres of coal land in Warrick County, a few miles northeast of Evansville. The Mitchem mine now has a capacity of 400 tons of coal daily, and the new company expects to double this capacity during the next 60 days.

Bicknell—Work has been started on a new mine west of Bicknell that will give employment to 300 men when completed. The mine is being put down by the Howe-Goulter Coal Co., a Knox County organization.

Boonville—The Big Four Coal Co., of Boonville, which has a mining capacity of 1000 tons daily, has been sold to persons in Louisville, who will double the shift and increase the capacity of the mine. The mine was owned by John Heinze, John Kelly and George Mester.

ILLINOIS

Carbondale—The Lewis Bros. Coal Co. has been incorporated here with a capital of \$30,000 to make preparations for the development of a 1000 acre tract of coal lands in Williamson County, east of Marion and adjoining Saline County.

Springfield—The new Consolidated code bill which was proposed by Governor Lowden of Springfield and which has become a law, has resulted in several mining companies in several parts of the state being heavily fined for having architects and horseshoers in their employ without a state license. Nearly every trade occupation in the state, such as plumbers, etc., must be licensed.

Carlinville—What is intended to be the largest producing coal mine in the United States, if not in the world, is now being sunk by the Superior Coal Co. between Sawyerville and Dorchester, 16 miles south of Carlinville, in Macoupin County. The Superior Coal Co. now operates three mines in that vicinity.

Springfield—The Miners' Examining Board for the month of September is announced as follows: Spring Valley, Sept. 8; Danville, Sept. 10; Springfield, Sept. 14; Taylorville, Sept. 17; Staunton, Sept. 18; Harrisburg, Sept. 20-21; Benton, Sept. 24-25; Herrin, Sept. 26-27; DuQuoin, Sept. 28; Collingsville, Sept. 29.

IOWA

Ogden—The Ogden Consolidated Coal Co. under the receivership is making wonderful strides toward the rehabilitating of the property since reopening the mines the first of last December. The production of tonnage has been steadily on the increase and the mines gradually put into workable condition, until at the present time Receiver Dyer and Superintendent Kennedy hope shortly to be producing around 600 tons of coal per day.

ARKANSAS

Fort Smith—Leading coal operators in the Fort Smith field have raised a question which it is stated they are seeking to bring before the federal department by means of a conference with representatives of the Federal Trade Commission. Steps are being taken to secure a hearing at Kansas City. The issue raised is that the new bituminous coal prices fixed by the Government do not apply to this field, on the ground that the coal in Sebastian, Logan, Johnson and in LeFlore Counties, Oklahoma, is not bituminous, but anthracite and semi-anthracite.

COLORADO

Denver—That the Government will have to take over and operate the Colorado coal mines if there is to be any reduction from present prices is the claim the coal operators of the state will present to Coal Controller Garfield at Washington next Monday, it became known last week. This decision was reached following a conference of operators representing 210 producing mines. A committee of seven men, appointed by the conference, are on their way to Washington.

UTAH

Salt Lake City—The Supreme Court recently issued an alternate writ of mandamus against the county assessor and county commissioners of Carbon County, directing them to revise their assessment of coal lands in Carbon County according to the provisions of the state statutes, or show cause for their refusal to meet the requirements of the law at a hearing before the Supreme Court. It is charged by the petitioner the Carbon County board of equalization assessed all coal lands at \$50 an acre, instead of at their real value, which is said to range from \$50 to \$10,000 an acre. If the erroneous assessment is permitted to remain undisturbed the petition of the attorney general states, the state will be deprived of several thousands of dollars of revenue in the form of taxes to which it is entitled under the constitution and laws predicated upon the constitution.

Foreign News

CANADA

Winnipeg, Ont.—Coal dealers are having difficulty in obtaining their winter supply of anthracite. The trouble is that they cannot get railway transportation on the American side from the mines to the Lakes. The boats have waited in vain for their coal cargoes, and are putting in time carrying other freight, which is equally as bad.

Bridgeburg, Ont.—The Canadian Government has warned everyone in the eastern provinces that there will be a shortage of coal this winter and the Provincial Natural Gas Co. has notified its customers that there will be a shortage of that fuel this winter. There probably will not be more than enough gas for cooking purposes. And along on top of these warnings is the constantly reiterated advice relative to the war that everybody "keep cool." The expectation is that that won't be hard.

Personals

M. W. Taber, formerly Detroit manager of the Asbestos Protected Metal Co., of Pittsburgh, Penn., has been appointed factory manager of the company.

W. W. Cole, formerly with the Spring Valley Coal Co., Spring Valley, Ill., has accepted a position as engineer with the Kentucky River Coal Corporation. He will be located at Hazard, Kentucky.

C. A. Crowe, formerly manager of the Grand Rapids office of the Asbestos Protected Metal Co., of Pittsburgh, Penn., has been placed in charge of the Detroit office of the company. The office is located in the Penobscot Building.

COAL AGE

Glenn J. R. Toothman, of Edwardsville, Ill., has resigned as mining engineer for the Madison Coal Corporation and has accepted the position of chief engineer for the Hutchinson Coal Co., of Fairmont, W. Va. His headquarters will be at Hepzibah, West Virginia.

George O'Brien, formerly mines inspector at Fernie, B. C., has accepted a position as mine superintendent at No. 4 mine of the Canadian Collieries, Ltd., at Cumberland. He has been an inspector for the Provincial mines department for the past three years.

Wade H. Horn, who for the past few years has been chief mining engineer for the Raleigh Coal and Coke Co., Raleigh, W. Va., has resigned, to accept a position with Prof. F. A. Ray, consulting mining engineer, 431 Citizens Bank Building, Columbus, Ohio.

Byron H. Cannon, of Pittsburgh, Penn., has resigned his position as real estate and claim agent of the United Coal Corporation in order to look after his personal interests. No successor to Mr. Cannon will be appointed, but the duties will be apportioned among other officials.

T. H. Williams, mines inspector for the past 5½ years in the Crow's Nest Pass section, British Columbia, has resigned to accept a position as superintendent of the Michel mines of the Crow's Nest Pass Co. He will take the place of former mine inspector Charles Graham.

Joseph C. Trevonow, who recently left the Elk Lick mine of the Merchants Coal Co. to accept the superintendency of the Rich Hill mine of the United Coal Corporation, at Meadowlands, Penn., has been transferred to the Naomi mine of the Naomi Coal Co., located near Belle Vernon, Penn., a subsidiary of the United Coal Corporation, on account of the sale of the Rich Hill mine.

Obituary

Loftus Cuddy, aged 65, a prominent Cleveland vessel and coal man, died suddenly from apoplexy recently at Breton Woods, N. H. Mr. Cuddy founded the Cuddy-Mullen Coal Co., of Cleveland, one of the largest on the Lakes, which was later absorbed by the Pittsburgh Coal Co.

Walter O. Roberts, a well-known mining man of Wilkes-Barre, Penn., died recently from heart trouble. He was 56 years old and had been a resident of Wilkes-Barre practically all his life. At the time of his death he was treasurer of the Red Ash Coal Co. He also was identified with many other coal interests. He is survived by his mother.

Frederick Steidel, who was superintendent of Packer No. 3 colliery of the Lehigh Valley Coal Co., died suddenly on Aug. 31 at Shenandoah, Penn., at the age of 47 years. The cause of his death was an attack of acute indigestion. Mr. Steidel was a mine expert of note and the inventor of many mine devices. He was popular in the Schuylkill region and was a prominent Mason. His widow and three children survive him.

Charles M. Russell, age 85, founder and president of the Parker-Russell Mining and Manufacturing Co., died at his home in the Hamilton Hotel in St. Louis, on Aug. 31, after a long illness. The deceased was born in St. Louis and had spent the greater portion of his life there. He was graduated from Yale University, and the beginning of his business was that of producing coal and fireclay in St. Louis under what is now one of the fashionable south West End resident sections. Of late years his activity had been confined to the production of fireclay only.

Industrial News

Fairmont, W. Va.—The Fairmont Mining Machinery Co. has found it necessary to add another story to its office building, owing to the large increase in the amount of work handled.

Steubenville, Ohio—The Apex Coal Co., Camp No. 2, began coal-stripping operations last week between Amsterdam and Germano. The company is using a Marion No. 300 coal-stripping shovel, which is the largest size made.

Pittsburgh, Penn.—The Mine Safety Appliances Co., owing to its increased volume of business, has been compelled to lease much larger quarters in the Chamber of

Commerce Building, in which it hopes to be installed on or about Oct. 1.

New York, N. Y.—Reports just made public show that during the month of June there were exported from the Port of New York 14,693 tons of anthracite coal valued at \$106,173; 1939 tons of bituminous valued at \$14,466 and 3650 tons of coke valued at \$49,646.

Columbus, Ohio—Under the name of the Consolidated Mining Co., the headquarters of the Royal Flush Mining Co., of Straitsville, has been transferred to Columbus, with offices in the Columbia Building. Henry Watkins is president and his son, J. L. Watkins, is secretary.

Louisville, Ky.—The Circle City Coal Co., of which Frank Fehr is one of three incorporators, will begin operations within a short time upon 3000 acres of coal lands. It is expected a daily output of 1000 tons of coal will be mined. The capital is \$50,000. Those interested in the concern with Mr. Fehr are Frank A. Hecht and H. Gruscow, of Chicago.

St. Louis, Mo.—Low water in the upper Mississippi River is interfering with the efforts to get the coal-barge movement under way. The barges recently sent to St. Paul loaded with coal shipped by the Southern Coal, Coke and Mining Co. ran aground at Red Rock, Minn., on the return trip, loaded with iron ore. They were floated and proceeded down stream, but the water is lower than it has been in years and further trouble is feared.

Belleville, Ill.—St. Clair County for the physical year ending June 30 showed an increase of more than 57 per cent in coal mines over the preceding year. This year the tonnage produced was 5,748,196, an increase of 2,461,947 tons. Forty-seven shipping mines and 16 local mines produced this tonnage. Nine new shipping mines were opened and six additional are now ready to produce. There were 57 accidents and ten deaths.

Cardiff, Alberta—The Cardiff Collieries have brought in a new outfit from Milwaukee stated to be the most modern thing in dragline machinery, for stripping the overburden from the top of the coal to allow extraction from the surface. This will prevent the wastage of a large amount of coal to support the roof. The coal varies from 20 to 40 ft. below the surface. The new machinery will strip 4000 to 5000 cu. yd. in 10 hours.

St. Louis, Mo.—The Wabash Ry. has just put in for freight and coal service 25 new locomotives, known as the 2-10-2 type, which are the largest in operation in this part of the country. The engines are 70 ft. long and weigh 592,000 lb. with a tractive force of 70,000 lb. The tender carries 10,000 gal. of water and 18 tons of coal. It is arranged so that either lump or mine run can be taken on and crushed as it is fed to the stokers. These locomotives will haul 100 fifty-ton cars of coal, a total tonnage of 10,000,000 pounds.

Columbus, Ohio—The Leckie Coal Co., Inc., which had offices at Norfolk and Detroit, has decided to make its headquarters in Columbus and to that end has taken a suite of five rooms in the Hartman Building. T. S. Crockett, of Norfolk, will be in charge and W. S. Taylor, now Western sales manager located at Detroit, will be with the Columbus office. The Leckie Coal Co. was formerly known as the West Virginia Coal Sales Corporation and operates eight mines on the Norfolk & Western and Virginian railroads in West Virginia.

St. Louis, Mo.—An enormous increase in the mining industry in St. Clair County, Illinois, is shown by the annual report of A. F. Jakoubek, county mine inspector, for the fiscal year ending June 30, 1917. It shows that the mines of the county produced 5,748,196 tons, an increase of 2,461,947 tons, or 57 per cent, over the preceding year. There are now 47 shipping mines in the state, an increase of 9 over the preceding year. Six new mines are about to be opened. There are also 16 local mines. During the year there were ten fatalities. Last year there were only four.

Norfolk, Va.—President Harahan, of the Seaboard Air Line, and chairman of the southeastern department of the railroads war board, announced recently that the roads in his department up to Aug. 15 had eliminated 116 passenger train schedules as a part of the movement for increased efficiency in handling troops, ammunition, supplies and foodstuffs. This has resulted in releasing 91 locomotives and 426 men for other service and will result in a coal saving of 233,754 tons a year. Permission has been asked of the corporation commissions of the various states for authority to discontinue 30 additional passenger trains.

Market Department

GENERAL REVIEW

Practically all the larger anthracite companies have adopted the government schedule of prices, with independents making various advances. Production of bituminous is decreasing with no spot coal on the market except in the Southwest.

Anthracite—The production and distribution of anthracite is going on practically unaffected by the Government price-fixing policy. All-rail movement of this coal to New England is improving slightly. All of the larger anthracite companies have adjusted their schedule of prices to agree with those fixed by the Government, and the market generally has a feeling of security. The demand for domestic coals is steady, but stocks are low; only the steam coals are in good supply. Individual operators have made varying advances in their prices, and consumers, in some districts, entertain hope for lower retail figures. Heavy shipments of anthracite are being made from various Lake ports to the Northwest. The supply in that region, however, is said to be somewhat below normal.

Bituminous—The price-fixing orders of the Government appear to be strictly observed all over the country, but the sales of coal at a \$2 run-of-mine price are extremely scarce. During the past week only a few thousand tons have been sold at this figure, these sales taking place at Hampton Roads and St. Louis. Operators over practically the entire country claim that their contracts are taking their entire output, and, furthermore, that they cannot do business on the \$2 run-of-mine basis. Already throughout western Pennsylvania and eastern Ohio many of the small mines have ceased operations, and still others are expected to do so shortly. Much uncertainty prevails throughout the trade concerning prices which may be charged by retail dealers. Many of these have considerable stocks of coal which were purchased at prices much above those named by the Government, and if these stocks must be disposed of at the lower prices, it will mean a decided loss for many of these dealers. Stocks of bituminous coal throughout the country appear to be small and it is believed, in many localities, that it is only a question of a short time until the consumers without contracts covering their full needs will be in distress and not a few manufacturing plants will be compelled to shut down. Of course, there is the hope that a new schedule of prices may be published by the Government or certain concessions made to mining districts where the cost of production is high.

Lake Trade—The Lake coal trade is progressing rapidly, and heavy shipments are being made from ports along Lake Erie to the Northwest. These shipments are being made with precision and dispatch, and there is little delay at the loading ports.

Middle West—Much confusion exists throughout the Middle Western coal markets, not only among jobbers and retailers, but also among producers. Several mines in the Illinois field, particularly those in the western part of the state, have shut down, pending hoped-for authority to increase the mine price of coal. Indiana and Illinois mines are short of labor, but the car supply is improving. Miners throughout this district are expected to ask their employers for an increase in the wage scale probably as great as the one agreed to last spring. In the Southwest a fairly good market is making its appearance with certain uncertainties to be overcome. Coal appears to be plentiful and the demand increasing. This is particularly true of coals used for steam raising, while the domestic demand can hardly be said to be good. No Eastern coals are on this market. Although labor is scarce, the car supply is improving and the dispatch of cars to market is decidedly better.

A Year Ago—Threatened stoppage of transportation caused a heavy business in anthracite and prices continue stiff. Bituminous market easily absorbs surplus accumulations of speculative coal and continues firm. Lake shipments considerably behind. Urgent demands in the Middle West.

BUSINESS OPINIONS

The Iron Age—The magnitude of the Government's task in fixing steel prices is shown in repeated postponement of action. In the past week prominent producers have been called upon for additional data, and there is still no appointment for the expected meeting of the War Industries Board and the general committee of steel manufacturers.

The markets for pig iron, semi-finished steel and rolled products continue to drift. Indications of coming readjustments are chiefly those given by resale transactions which are but meager basis for conclusions. At Pittsburgh there has been no duplication of the sales in steel-making pig iron, which in the last week of August showed a softening market, but offers of resale billets and slabs at \$70 as against \$100 in July are ample comment on the disappearance of competitive buying of shell steel for Europe.

The August pig-iron statistics emphasize again the little success of blast-furnace operators in the face of coke scarcity. The output was 3,247,947 tons, or 104,772 tons a day, against 3,342,438 tons in July, or 107,820 tons a day. New, modern blast furnaces were started last month at five steel plants—Midvale, Bethlehem, Donner, Republic and Whitaker-Glessner—yet with all this reinforcement production declines. Many furnaces were banked for days at a time for lack of coke.

Dunn—In volume, new business is not what it was a year ago, but conditions are clearly more wholesome and the transition to a more natural range of prices, though accompanied by some evidence of unsettlement, can only be regarded as favorable in its ultimate bearing on the future. By far the most significant feature of the present situation is the process of readjustment in some commodities in which there had formerly seemed no end to the advances, and buyers whose immediate requirements are well covered now hold off in the expectation that the markets will turn more strongly to their advantage.

Bradstreet—Governmental buying, moderate expansion in regular fall business, light retail trade at the East, exceptionally good crop reports, activity in industry, liquidation in the stock market induced by concern over the excess profits tax, and unanimity of opinion respecting the expected large proportions of fall trade, stand out as the pre-eminent features of present-day trade conditions. In the larger sense, war demands concededly dwarf ordinary commercial business to a greater extent, perhaps, than at any time in the past three years, but even so progress in normal channels is seen, now that the fall season is close at hand, this manifestation being more evident at centers that cater to the agricultural regions than it is in the industrial zones, which latter certainly continue active.

Dry Goods Economist—Throughout the country general business on the larger scale has been checked to some extent, awaiting price fixing by the Government on certain materials. The influence of the possibility of price fixing being applied at a later date to other products has also been apparent.

Marshall Field & Co.—Current wholesale distribution of dry goods is running ahead of the very heavy shipments for the same period a year ago. The total volume of road sales for immediate fall and spring delivery has been in excess of the same week in 1916. Merchants have been in the market in slightly smaller numbers. Collections are ahead.

Atlantic Seaboard

BOSTON

Status of bituminous unchanged; no sales and no quotations. Spot coal not available and interest centers on probable developments when Government takes further action. Meanwhile shipments from all regions continue on contract and on sales made previous to the President's order. Anthracite all-rail movement improves slightly.

Bituminous—For the first time within memory of those now in the trade a fortnight has passed with practically no sales and no prices. The hiatus bids fair to

continue until some adjustment is made, either on the part of the Government or by the operators affected. Part of the delay is due to the fact that at this writing the Federal Coal Administrator has been engrossed in details of price-fixing on another commodity and has not yet had time to make clear the attitude of the Government toward prices in regions where the executive order has been thought likely to work injustice.

There have developed two rather well-defined opinions: One that the Government circular should be rigidly adhered to as long as the authorities deem necessary, and the other that prices should be revised upward in districts where the situation is difficult to handle.

It is easy to see that these two opinions depend chiefly upon the mining cost in the individual cases. At this writing there seems no progress toward a settlement, although factors here are keeping in constant touch with Philadelphia, New York and Washington and are scanning every report that comes.

Rumors early in the week that sales had been made at \$2 per net ton f.o.b. mines could not be substantiated. It is possible that certain producing companies did make sales as a matter of policy. The Pocahontas and New River agencies are confining their deliveries strictly to contracts, Government orders, and to sales that were made before the President's order was issued.

In the smokeless regions, according to opinion here, the stipulated price is not unfair, whether on run-of-mine, prepared sizes, or slack, but most of the operators are committed so far ahead that it is unlikely that more than a few mines will suspend even if the Government order is carried out in its original terms.

Dispatch from Hampton Roads is fair, although occasionally ships have had to wait this week for several days. There have been several spot orders in the market for New England delivery, but so far as reported factors here were not able to make any purchases.

The situation on new business is completely deadlocked, whether f.o.b. Norfolk or alongside Boston. Even rehandlers are shy of quoting coal for inland delivery, lest they be called to account later. It is an anomalous condition and one that will call for drastic action before many weeks. It seems as if some less horizontal price-fixing would be an advantage. In the case of wheat a price was named at a given geographical point, but of course the coal output is handled differently and it is extremely difficult to standardize distribution where mining conditions differ so widely.

With the Southern coals moving on contract exclusively and Georges Creek largely reserved for Naval use, the main source for what might be called New England's emergency supply is central Pennsylvania. The increased production is due in good part to numerous small operations which the market price prior to Aug. 21 would permit mining at a profit. Most of these mines have orders enough in hand to keep them going for several weeks, and that is one reason why the general situation has not grown rapidly acute.

Buyers, too, have kept watchful eye on developments in the hope that the Government action would soon put them in position to get forward the stocks they were trying to accumulate a few weeks ago.

It is believed that New England mills had on hand at the time prices were fixed only about 45 days' supply. Of course deliveries are being made from day to day, but buying stopped entirely. The real rub will come when orders entered on the former basis are fully shipped.

The present status has many possibilities, but intelligent opinion seems to favor some modification of the original price ruling and that the coal administrator will be able to work out some equitable basis where mining cost is high. Labor will have to be sympathetically dealt with, or production will be seriously curtailed. The Government alternatives are so plain that he who runs may read, but whether there will be resort to them is doubted.

Efforts to buy coal at the New York and Philadelphia loading piers have not met with success. Plenty of would-be pur-

chasers are willing to pay the old August basis, but we hear of no sales.

Retailers, too, are among the anxious waiters. Prices have not been changed in Boston or anywhere else in New England so far as is known. The feeling seems to be that dealers are justified in charging the old price until they receive coal at the Government basis. How all these problems are to be worked out seems for the present to be up to Doctor Garfield.

As was the case last week, there are no quotations to be reported. Rumors are heard but they are next to impossible to run down. A few actual sales aggregating a few thousand tons were made the latter part of the week. They are of smokeless coal at a price, f.o.b. Hampton Roads that nets \$2 per ton at the mines. This shows that there are agencies that are disposed to adhere to the Government price on new transactions.

Anthracite—The Federal Trade Commission has officially corrected the misunderstanding that arose from its recent report on retail coal prices in Boston. The press had taken the "margin" referred to in the report as "net profit," but it is now made clear that out of the "margin" must be paid all the cost of conducting the retailer's business from the time he receives the coal until he actually delivers it to the customer and collects the money. This puts a rather different face on the matter than the original report.

The New England Coal Committee has taken exception to the statement in this column on Aug. 25 with regard to "solid trainloads." The fact that Aug. 18 the only company that up to that time had responded to any extent ceased sending solid trainloads into New England naturally led us to make an unfavorable forecast. As it happened the company in question did resume such deliveries on Aug. 25, the day "Coal Age" was distributed. Meanwhile another anthracite company had responded and one train each came forward on the 19th, the 22nd and the 24th.

At this writing, Sept. 3, 60 solid trains have come through, for which the New England Coal Committee considers its efforts responsible, this special movement having begun July 15. The train-loads are by no means uniformly of 50 cars each of 50 tons capacity. The number of cars has ranged from 31 to 48, the average being about 37. Many of the cars latterly have been of small capacity, 23 to 27 tons, of a type not sent to the Tidewater loading piers, ordinarily, making the average train-load much nearer 1000 tons than 2500.

Every little helps and it is on this basis that the New England Coal Committee is entitled to credit for much hard work.

Market conditions are unchanged. New England is still far in arrears, and shipments, especially at Tidewater, are exasperatingly slow.

The September circular is in line with the President's order, some of the companies having advanced the price of pea 90c. in order to conform strictly to the text of the Government ruling.

Quotations on "independent" coal are heard up to \$6.20, f.o.b. mines, for egg.

NEW YORK

Anthracite operators adjust prices and market has a feeling of security. Demand for domestic coals steady but stocks are low. Buckwheats in good supply. Bituminous producers taking care of contracts. Free coals are scarce and market in serious condition.

Anthracite—Most of the operating companies have adjusted their September prices to conform with those announced by the President, and these will, no doubt, prevail for the fall and winter, with the result that the trade feels secure as to its immediate future. The advancing of the price for pea coal means a substantial increase in the earnings of the companies and will put this size in the position where many operators have contended for some time it should be. Independent operators are entitled to 75c. per ton more for their product than the big companies.

While statistics may show that New York is getting its proportionate share of coal produced, the fact remains that dealers complain of their inability to obtain sufficient tonnage to meet the demands made upon them. Stocks at Tidewater are as low as they have been in many months, and while the large producers are able to meet the demands of their regular customers, at least partially, they are not able to take care of any large amount of outside trade.

Independent operators have for some time been sending most of their product to other markets, consequently little of their coals can be picked up here. Middlemen with regular customers are hard put for supplies

and are having difficulty in securing sufficient coal to fill orders.

Operations at the mines are being continually interrupted by labor troubles or outings. One of the big companies had one of its largest collieries idle several days last week on account of a wage dispute and similar experiences have been had by other companies. A threatened strike by the firemen in the upper region has been referred to the Board of Conciliation for adjustment. These interferences with the output tend to create anxiety among dealers and consumers here and consequently result in increased demand and urgency for shipment of orders already booked. The outcome of the efforts of the companies to have the miners exempt from draft is also being watched closely.

So far the local retail dealers have taken no action towards advancing their prices and it is not believed there will be any change.

There is more chestnut coal at the docks than either stove or egg, with stove the shortest. The demand for stove is particularly heavy but shippers are unable to relieve the situation. Pea coal continues to be scarce.

With the buckwheat coals plentiful the railroads are storing some. Prices are easy.

Bituminous—The trade has not as yet recovered from the shock given it when the President announced the new mine prices and the result is that the local market has been at a standstill so far as buying and selling of spot coals is concerned. Consumers say they have not been able to find any \$2 coal and middlemen claim they are unable to get it from the operators. The latter say it takes all of their output to take care of their contracts.

This enables many operators to keep their mines going, but small operators who have no contracts are awaiting the outcome of conferences now being held at Washington, at which the matter of future action in regard to the prices is being discussed. Many of these small operators declare that unless the prices are modified they will be forced out of business.

The scarcity of coal here is being felt by many industrial concerns, who either did not contract for their year's supply or did so only in part. Their efforts to secure a full supply in the open market is meeting with failure and it is feared that unless more coal is forthcoming shortly it will be necessary to suspend operations.

Tidewater stocks are small, free coals being practically out of the market, with shippers expecting smaller production and increasing labor shortage.

Wholesale dealers say they have no coal to sell and that they do not know when they can expect any to arrive. A sale of one car of \$2 coal was heard of. Bunkering is slow due to the scarcity of supplies.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports, are as follows:

	Circular	Individual
Broken	\$5.95	\$6.70
Egg	5.85	6.60
Stove	6.10	6.85
Chestnut	6.20	6.95
Pea	5.30	6.05
Buck	4.00@4.15	4.50@5.10
Rice	3.40@3.60	3.25@3.40
Barley	2.90@3.10	2.25@2.75

Quotations for domestic coals at the upper ports are generally 5c. higher, on account of the difference in freight rates.

PHILADELPHIA

Anthracite companies all adopt Government prices. Individuals make varying advances. Consumers have hope for lower retail prices. Shipments of all sizes continue light. Bituminous shipments short. Car supply serious. Diversions to other markets hurt local trade. Price order fully observed, but hope of change is strong.

Anthracite—While the news had been discounted by the trade generally, the buying public manifested much interest as to whether the mining companies would adopt the maximum prices as fixed by the Government order. There was some doubt as to whether the Philadelphia & Reading Coal and Iron Co. would decide on the \$4 price for pea coal instead of \$3.10, as fixed for its winter schedule last April. However, this company will now sell its pea size at \$4, which actually means that the retail price will be advanced. The popular idea of Government regulation has always been a reduction.

The circulars as issued also include the special coals, such as Lykens Valley and ordinary red ash, and while these coals are

always higher than white ash, the Government figures show slight reductions, which the companies have also adopted.

While the individual shippers are allowed an advance of 75c. above these prices, not all of them have taken full advantage of this provision. All have moved their pea coal upward in the same proportion as the big companies and since some of the individual shippers have been charging the 75c. advance for several months, there has really been no change in their schedules except to advance the pea coal.

The change in the schedule price of pea coal will in all probability relieve the tension and no doubt reduce the sale of this grade to consumers. As there is now but a difference of \$1 in the price of chestnut and pea, it is expected that many former users of the smaller sizes can be persuaded to burn the larger. Chestnut should not be in such short supply this winter, as it has already been delivered in large quantities, while the big drive on pea coal always comes late. The dealers continue to complain among themselves because of the large percentage of pea in the chestnut, but they are too anxious to secure an adequate supply of coal to carry this complaint to the shipper.

No increase either in demand or price is noted in the steam sizes. There is a feeling that should the radical reduction in the price of soft coal stand it will be reflected in the steam sizes of anthracite. Others claim that with the shortage of bituminous and the increased demand for anthracite that is sure to come with cold weather, it will have no effect. It will also be noted that the Governmental price-fixing order did not include the steam sizes of hard coal. Buckwheat at \$3.50 or a trifle less, is in fair demand. Rice is weak around \$2, while barley gains no strength and sales are reported at \$1.

The prices per gross ton, f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide, are as follows:

	Line	Tide	Line	Tide
Broken	\$4.55	\$5.70	Buck	\$2.90
Egg	4.45	5.75	Rice	2.40
Stove	4.70	6.00	Boiler	2.20
Nut	4.80	6.05	Barley	1.90
Pea	4.00	4.90		

Bituminous—There continues to be an urgent demand for coal here, with the supply probably shorter than ever. With many shippers the car situation grows more serious with each day. One fair-sized operation is known to have been actually unable to make a full day for the entire week on account of not receiving anything like its quota of cars. Other operations also report serious curtailment of their output for the same reason and it is hardly necessary to say that working under such conditions is far from profitable, being highly inefficient.

Quite a little criticism is being heard from both operators and consumers in reference to the order for preferential shipments to the Northwest. It is claimed that consumers in that territory have postponed their active buying awaiting more favorable prices and have now come into the market with a rush.

The car situation has also been further complicated by an order directing that 7000 additional empties be sent south for the loading of lumber and other material. These cars are to be diverted at once, regardless of route or ownership. With the heavy troop movement that has also just begun to the Southern camps it is hardly thought that any improvement can take place for the next few weeks at the shortest.

The question of price, of course, continues to be of foremost importance. While on the surface local interests present an air of calm compared to the previous week, yet there can be no denying that the operators are much agitated at the price-fixing order and are really at their wits' end to know how to meet the situation. While there are some of the largest shippers who may be able to come out even on a price of \$2, plus 15c. commission, the larger majority claim to be unable to do so and are therefore confronted by a most serious condition.

It is to be hoped that the almost daily conferences which are being held in Washington will soon be productive of favorable results. One thing is certain and that is that there is no \$2 coal to be had. So far as is known, the contracts which were made prior to the issuance of the price-fixing order will be allowed to stand and they are naturally receiving most of the coal produced. There has been no official notice to this effect, but as a matter of fact no one has received any notice as to the new prices other than what has appeared in the newspapers.

There is hardly a shipper who has not received requests recently from concerns extremely short of coal offering premiums of \$1 or \$1.50 for a few carloads. However, as a fine of \$5000 or three years' imprisonment, or both, attaches to a conviction for a violation of the Government's order, it can be taken for granted that no offers of this kind are being considered.

BALTIMORE

Soft-coal situation grows more serious hourly as fuel fails to arrive and consumers wipe out their stocks. Hard-coal movement a little better. Ten cent advance for September waits.

Bituminous—Every hour the bituminous-coal situation here grows worse. Stocks are rapidly depleted. Over Sunday and Labor Day there had been hopes that the railroads would get considerable of the loaded coal to tide, but this failed to materialize. A number of firms of importance here failed to find a single car number awaiting them when offices were opened Tuesday morning.

Every coal office has a line of waiting consumers who would like to get coal. Most of them are concerns that have not been working under contracts, or who have had contract deliveries insufficient to take care of their needs. These inquirers for fuel have all been doomed to disappointment. So far the Government \$2 coal has been entirely fictitious, there being, as far as could be learned, but one sale of such fuel here, and that to accommodate the city and keep the water pumping station going. Coal men have no \$2 coal.

The result is that fuel men are bending their energies only toward moving contract coal and are already far behind on this task alone. Already the rumblings of discontent among consumers can be heard and this rumble is likely to become a howl unless a quick change comes in the situation here. Production has undoubtedly been hard hit by the new price maximum. The trade as well as the consuming public awaits anxiously some solution to the serious problem. Terminals here are pretty well swept clear of coal.

Anthracite—Some of the dealers here report supplies a little easier. Coal is being placed in a number of bins this week on orders that have been on the books since last spring. The trade is still thousands of tons back on its obligations, but is hoping that an easier delivery will enable a big catch-up before real winter weather arrives. Pending settlement of price questions generally, the trade has not made the usual Sept. 1 advance of 10c. a ton.

HAMPTON ROADS

Heavy stocks. Congestion at piers relieved. No prices quoted for new business. Neutral steamers delayed securing bunker licenses.

At present the stocks at the various Hampton Roads terminals are larger than for some months. This is due in some measure to the scarcity and difficulty of securing vessels. For all practical purposes, it may be said that the congestion at certain of the piers has been materially relieved and prompt dispatch is now the rule. The coastwise movement is brisk, with freight rates around \$2.50 per ton from Hampton Roads to Boston. Exports would no doubt be heavier if it were possible to secure vessels. The Navy Department is still taking considerable tonnage and will no doubt continue to do so, but the apprehension of some shippers that the tonnage taken will be of enormous proportions seems to be without foundation. Pending the definite settlement of Government prices at the mines, no quotations are made for new business.

No orders have been accepted in this market on the \$2 or \$2.15 basis. Bunker coal is still being sold to foreign steamers around \$6.50 per gross ton. All neutral steamers are being delayed in securing permits for bunker coal. Export licenses for cargo are not so difficult to obtain. No neutral steamer may secure bunker license unless a guarantee is given that the steamer will return direct to the United States. This is part of the plan for controlling neutral tonnage. Even with such guarantees there is a good deal of delay in issuing licenses, though some improvement may be evidenced after the Exports Administrative Board has got in good working order. During the month of August a total of 1,464,293 tons of coal was dumped over the Hampton Roads terminals.

Dumpings at the Hampton Roads piers for the past several weeks were as follows:

	Aug. 4	Aug. 11	Aug. 18	Aug. 25
Nor. & West.	121,170	115,925	178,071	155,280
Ches. & Ohio.	81,188		116,595	
Virginian...		108,117	96,132	68,000
Total		390,798		

Lake Markets

PITTSBURGH

Full car supplies for Lake coal movement and shipments heavy. Cars for commercial loading few, but improvement this week. Expectations of higher Government price.

Beginning Monday or Tuesday of last week the railroads have been filling completely the requisitions for cars for shipping Lake coal, in accordance with Priority Order No. 1, and Lake shipments have been quite heavy. Car supplies for commercial loadings were meager last week, and on some divisions there were days on which not a single car was furnished. The outlook for commercial users late last week was blue and some of the steel mills were in danger of having to curtail operations this week on account of coal shortage.

Tuesday supplies for commercial loading were nearly full on the P. & L. E. and the B. & O., while the Pennsylvania divisions averaged 65 per cent. This is encouraging, but car supplies on a day following Sunday and a holiday are not a criterion for the remainder of the week, and while consumers feel more comfortable, the situation is tense.

There are only occasional sales at the fixed prices of \$1.75 for slack, \$2 for mine-run and screened coal, with 15c. added for brokerage when the business passes through a broker, but the total turnover is practically insignificant. Operators continue to assert they have no free coal, as they are applying their output on contracts.

Private advice from Washington, believed to be authentic, are to the effect that there are strong prospects that within a week or so the Government will advance its "provisional" prices, recently fixed, by a larger fraction of the 50c. a ton that has been in dispute. Meanwhile, the only quotable market is the Government schedule referred to above.

BUFFALO

No \$2 coal. All the operators claim that their contracts take all their output. The consumer with no contract is in distress. Heavy Lake shipments of anthracite.

Bituminous—The trade is at a standstill, so far as the selling of free coal is concerned. Contract coal is all that is moving and the operators claim that they have no more. It is stated that about 80 per cent. of the normal output is now under contract and that is all that the mines can turn out now. The contracting during the regular spring season was said to be light, but the operators saw what was likely to take place in time to add a big tonnage to their list. In fact they made many contracts through the summer, especially when it was expected that the Government would put on a maximum price.

The regular quotation at \$2 for base will have to be repeated, if any is made, though it is impossible to find a shipper who will state that he has sold any coal at that figure. There is no difference made between steam and gas coal, though they have formerly differed 50c. or less in favor of gas coal. Quotations per net ton, f.o.b. Buffalo, are as follows:

	Lump	Slack
Pittsburgh (rail rate)	\$3.55	\$3.30
Bessemer (rail rate)	3.50	3.25
Allegheny Valley (rail rate)	3.40	3.15

It is impossible to get a quotation of such special coals as smelting or smokeless. Sellers of cannel say they have not reduced their prices of about \$6.50 net to dealers, as they have to compete with anthracite.

Anthracite—The situation is not much changed, except that the Buffalo retailers are not yet caught up with the large amount turned into the city trestles several days ago on account of a shortage of Lake tonnage. So Buffalo consumers are not complaining, though outsiders appear to be as short as ever.

Lake shipments are heavy, being for the week 150,750 net tons to domestic ports alone, no export figures now being available. Of this 74,800 tons cleared for Duluth and Superior, 29,800 tons for Chicago, 25,600 tons for Milwaukee, 8700 tons for Sheboygan, 4650 tons for Racine, 3000 tons for Manitowoc, 3000 tons for Green Bay, 1200 tons for Kenosha.

Freight rates are strong at \$1.25 for Racine and Kenosha, 75c. for Sheboygan and Green Bay, 65c. for Manitowoc, 60c. for Chicago, 50c. for Milwaukee, 45c. for Duluth.

TORONTO

Conditions much improved. Speculators eliminated by demurrage charges. Anthracite active but demand for bituminous quiet. Coal coming forward freely.

The coal situation has much improved lately, owing to the imposition of stiff demurrage rates by the railways. Cars are now unloaded more promptly and congestion lessened. This measure has had the effect of eliminating speculators who, having no facilities for storage, detained cars for an unreasonable time until they could effect sales.

Coal is coming forward well and business getting back to more normal conditions. The anthracite market is active, but bituminous rather quiet, most of the larger consumers having laid in stocks and others buying from hand to mouth.

Prices remain unchanged, with quotations for best grades per short ton as follows: Retail: Anthracite egg, stove, nut and grate, \$9.50; pea, \$8.50; bituminous steam, \$9; slack, \$8 to \$8.50; domestic lump, \$9; cannel, \$11. Wholesale, f.o.b. cars at destination, three-quarter lump, \$7 to \$7.50; slack, \$6.85 to \$7.

TOLEDO

Demand from steam users and dealers exceeding the present supply. Lake shipments being moved rapidly to the North.

The market was thrown into confusion by the issuance of the order of the Government pertaining to coal prices. Wholesalers assert it will be quite a while before conditions will be adjusted and the work of supplying coal to the consumers takes on normal aspects. Most large users of coal have been caught short of ready supplies and as a result are suffering for want of fuel with which to carry on their businesses.

A recent redistribution of cars among the mines by the railroads, allowing those having Lake shipments a certain percentage of additional cars for this department of the trade, has been a great help in expediting the movement of Lake coal to this port. Railroads, too, are handling Lake coal from their yards in this city to the docks much more efficiently as a result of this order.

More vessels have been put into service as coal carriers and the volume of coal going north is pleasing the Lake men. The possibility of a serious coal shortage in the Upper Lakes, they declare, is fading and should the Lakes remain free of ice for a reasonable length of time after the close of navigation there will be at the worst only a small shortage.

Prices, f.o.b. mines, are as follows:

	Lump and Mine-Run	Nut and Egg	Slack
Hocking and Pomeroy.	\$2.00@ 2.35	\$2.25@ 2.60	\$1.75@ 2.10
Kentucky..	1.95@ 2.40	2.20@ 2.65	1.70@ 2.15
Pocohontas.	2.00	2.25	1.75
West Virginia spint....	2.00	2.25	1.75

DETROIT

Reduction of mine prices on bituminous is expected to bring increase in demand. Anthracite trade continues sluggish. Lake shipments maintain good volume.

Bituminous—While no marked increase in volume of buying has yet developed in the steam-coal trade in Detroit, following action taken by the Government in fixing prices, wholesalers and jobbers are of the opinion that one of the results of the price reduction will be a larger demand for coal, a few weeks later in the year. This increase in demand is expected to materialize about the time that industrial plants begin production in normal volume after the usual summer period of slack activity and when lowering temperatures suggest replenishing fuel supplies of the apartment buildings and other large consumers.

Anthracite—Despite the naming of prices on anthracite at the mines, the Detroit jobbers and wholesalers report no appreciable increase in business. The withholding of orders is in part ascribed to the continued uncertainty of retail dealers as to what future action the Government may take in the matter of designating profits for wholesalers and for retailers.

The chief trouble in the anthracite market continues to be the obtaining of coal. Though producers report largely increased shipments during the first eight months of the year, jobbers say receipts are still light and that the supply obtainable would be inadequate in case of a normal demand.

Lake Trade—Shipments over the Lake routes are maintaining good volume and some improvement is reported in car supply available in moving coal from the mines

to loading docks. The total shipments in August are expected to go a long way toward offsetting the shortages existing at upper Lake ports on Aug. 1, this year, as compared with a year ago.

COLUMBUS

The coal trade is still in an unsettled condition, due to the recent price regulations. Labor troubles and car shortage are cutting down production.

The market has not yet recovered from the effects of the drastic price regulations as announced from Washington. As a result there is considerable uncertainty in every branch of the trade, except Lake business. Dealers as well as producers and jobbers are at a loss as to what to do and consequently a majority is playing a waiting game. There is some doubt if the present prices will continue for any length of time and dealers are not anxious to go ahead. In fact the uncertainty is such that little has been done up to date to supply the heavy deficiency in householder's stocks.

Lake trade is going on as usual with the exception of a smaller tonnage due to congestion on railroads and labor troubles. The price regulation has not affected the Lake trade materially and every effort is being made to supply the Northwest with fuel. Reports show that the coal is being moved from the docks almost as fast as it arrives and consequently there is no congestion.

Production has been seriously curtailed by labor troubles in the Hocking Valley and embargoes on several coal-carrying lines. As a result the output in the Hocking Valley has decreased to approximately 65 per cent. of normal and the same figures are reported from Jackson and Pomeroy Bend. Eastern Ohio produced about 60 per cent. of normal.

Prices on short tons, f.o.b. mines, are as follows:

	Hock-	Pom-	Eastern
	ing	eroy	Ohio
Rescreened lump.....	\$2.25	\$2.25	
Inch and a quarter.....	2.25	2.25	\$2.25
Three-quarter inch.....	2.25	2.25	2.25
Nut.....	2.25	2.25	2.25
Egg.....	2.25	2.25	
Min. run.....	2.00	2.00	2.00
Nut, pea and slack.....	1.75	1.75	1.75
Coarse slack.....	1.75	1.75	1.75

CLEVELAND

Maximum prices announced by Federal Government have caused large decrease in local tonnage by forcing wagon mines to shut down. Most of eastern Ohio coal being shipped to Lake. Car supply for month of August less than 50 per cent.

The maximum prices announced by the Federal Government on Aug. 22 has greatly affected the supply of spot coal coming to Cleveland, and in consequence a great many steam coal consumers have been hard pressed to secure enough fuel to keep them running.

Another supply that the jobbers have been depending upon to a great extent, namely the wagon mines, has been shut off as the wagon mine owners claim they cannot produce coal at \$2.25. When it is remembered that the wagon mines in the eastern Ohio district alone have been producing about 100 cars per day it can readily be seen how shutting off this tonnage has affected the supply for this market.

For the month of August the car supply at the mines in the eastern Ohio district averaged less than 50 per cent. of the capacity of the mines, notwithstanding promises of the railroads.

CINCINNATI

Immediate business is spiritless on account of new prices, confusion still prevailing as to practical details. Contract movement remains strong, with fair car supply.

The new prices fixed by the Government are naturally the most important market factor in this section, and the trade is still endeavoring to ascertain just how to adjust them to business conditions, both with reference to the contracts entered into in the past and the manner of taking care of supply and demand in the future. The domestic situation is the more complicated side of the market, inasmuch as consumers are naturally waiting for the lower prices which they anticipate on account of the Government's action, while dealers almost unanimously refuse to offer lower prices, inasmuch as they declare they are stocked with high-priced coal. They do not admit that they are in a position to sell at figures based on the new prices under the circumstances, and suggest that they cannot do so until they have on hand coal bought at the new figures.

Deliveries on contracts are progressing satisfactorily, there being little disposition on the part of large buyers, apparently, to try to escape paying the prices agreed, since they are fully aware of the primary necessity of getting the coal.

COAL AGE

LOUISVILLE

New price schedule continues perplexing and coal salesmen are in a quandry. Market at standstill. Eastern Kentucky-Tennessee strike reported in fair way to be settled.

The Louisville market continues in a sadly upset condition following the promulgation of the "immediately effective" price schedule, of which no operators or sales representatives appear to have been advised in any sort of an official way. In some cases business is being refused when offered on the new basis and efforts are concentrated on supplying contracts and orders previously on the books.

The eastern Kentucky-Tennessee operators are booking some orders, subject to settlement of the strike, on the Jellico basis of \$2.15, \$2.40 and \$2.65, with the 15c. added, limiting bookings to deliveries 30 days ahead. Western Kentucky operators represented in Louisville report no business being taken on the new \$1.70, \$1.95 and \$2.20 plus 15c. basis, although they state that there probably are some sales being made at that figure, f.o.b. the mines.

BIRMINGHAM

Activities in coal trade and production in suspense pending the hoped-for adjustment of government prices, and the ratification or rejection of Commissioner of Labor Wilson's proposition by the Coal Operators' Association and the Miners' Union.

Coal men are anxiously awaiting the answer of Government officials to their plea for an increase in the schedules on Alabama coal, having appeared before the Federal Trade Commission with cost sheet data supporting their contention for an adjustment of prices, the outlook being favorable for relief being given. In the meantime there is an attitude of "marking time" in every phase of the industry.

Much speculation is rife as to the action the miners will take in their convention in respect to the ratification or rejection of Commissioner Wilson's conciliatory agreement.

As it is, there is practically no coal available to the spot trade, though inquiries are strong and in some cases insistent.

Coke

CONNELLSVILLE

Market a shade easier. No inkling as to expected action by Government. Production and shipments slightly heavier.

The Government has not fixed prices for coke and there are no intimations as to when, if ever, this action will be taken. Meanwhile operators are securing all they can for coke, with prices fluctuating more or less from day to day, but on the whole with a slight decline in the week under review.

There is considerable speculation whether, in the event of the Government fixing a price on coke, it will develop that there are contracts in existence which would absorb the supplies. According to the common tale since July 1 there are scarcely any contracts at fixed prices, the bulk of the business being done on regular shipping orders against which there is a weekly or monthly price adjustment according to the spot market. In the case of coal it was supposed that there were relatively few contracts, but when the Government fixed the price the operators began shipping on contracts to the extent of practically their full output.

We quote the market at \$13@13.50 for spot furnace and at \$13.50@14.50 for spot foundry, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Aug. 25 at 358,504 tons, an increase of 7550 tons, and shipments at 363,519 tons, an increase of 5043 tons.

Buffalo—The expected reduction of prices, to follow the decline in bituminous coal, has not taken place to any extent, as the Government has not turned its attention in that direction yet apparently. The latest quotation of 72-hour Connellsville foundry is \$15 f.o.b. Buffalo with furnace \$13.50 and low grades and stock, \$11. Iron ore receipts are heavy, as much as 92,000 tons reported in a single day within a week. Unloading delays are heavy at Ohio ports, but much less here. The receipts for the week were 274,721 gross tons.

Birmingham—Coke production has been curtailed considerably during the past week by the scarcity of coal for charging. Inquiry is strong, but little business is being taken on, there being little coke available above contract stipulations. Prices range from \$14 to \$16.50 per net ton ovens, on spot foundry and \$11.50 to \$14 on contract sales. Furnace coke is reported as bringing from \$6 to \$10, but is almost unobtainable at any figure.

Middle Western

GENERAL REVIEW

Much confusion existing in Mid-Western coal market, especially among retail dealers. Some mines have ceased operations pending authority to quote higher prices than those named by the President.

Until the latter part of this week buying on the part of retailers has been almost at a standstill. The last three days has shown a considerable improvement, and shippers report the receipt of orders in large quantities for the domestic trade. There is, of course, much confusion throughout the retail trade due to the fact that generally dealers have stocked up considerable high-priced coal that has cost them from \$1.20 to \$1.75 per ton higher than present prices, and others have contracts to receive large amounts at regular intervals between now and next Mar. 31. These contracts call for prices much in excess of those now effective, and inasmuch as buyers of domestic coal will not pay the prices the retailers are compelled to ask for their contract and storage coal, the retail trade is rather quiet. A delay of another week or ten days is probable before the Government sees fit to name the margin of profit for the retailer.

A few of the smaller mines in Illinois have ceased operations. This it is claimed is due to the fact that the new prices are much lower than the cost of production, and while relief is expected shortly it is extremely doubtful whether the closing down of any substantial number of mines would allow others to make good the shortage which already exists.

It is reported on good authority that Dr. Garfield, Coal Dictator, will this week appoint a coal operator and miner councilor, and that he will make immediate individual exception on price, the burden of proof, however, will be upon any operator or district seeking a concession.

Shipments of Eastern coals to this market have been very light the past week, especially is this true of anthracite, receipts of which have not kept place with the local demand. Chesapeake & Ohio, also Norfolk & Western embargoes restricting car movement have prevented West Virginia coals reaching this territory.

CHICAGO

Indiana and Illinois mines short of labor but have good car supply. Miners to demand new wage scale at meeting in Indianapolis.

There has been some general improvement in the car supply the past ten days in the Indiana and Illinois fields, the mines operating close to 75 per cent. of full time. The greater part of the lost time has been due to labor shortage and mine disability instead of car shortage. Some complaint has been made relative to preference given to coal shipments for the Northwest, the contention being that in some districts of Indiana a serious shortage of coal was likely if the Pennsylvania and other roads carrying Eastern coals did not divert some of their shipments from Lake Erie ports, and make an effort to protect Indiana consumers who are dependent upon Eastern fuel.

The officers of the United Mine Workers of America have requested the operators of the central district to meet with them in conference at the Claypool Hotel, Indianapolis, Sept. 6, to consider the question of an increase in the present wage scale. Just what action will be taken has not as yet been determined, but the consensus of opinion is that the operators will be asked to grant increases which will amount to as much if not more than the wage increase granted last April at the New York conference.

Receipts of Pocahontas and other West Virginia coals have been light during the past week. Outside of contract movement little of this coal was to be had and most of the Chicago dealers have a light stock. This is also true of Hocking. Embargoes have prevented a substantial movement of these coals to the Western trade.

Shipment of anthracite via all-rail have been almost nil, while Lake receipts have not amounted to more than 15,000 tons. This amount is below the local demand and jobbers report their inability to supply the country dealers.

The Indiana mines have been operating about 70 per cent. of full time during the past week. An improvement in the car situation was noticeable the latter part of the week. The shippers continue to receive more orders than their mines can take care of, although there has been a

lack of buying on the part of retailers who claim householders are not laying in as much fuel as they should, considering the present outlook for a serious shortage a few months hence.

Operators in the Brazil block field of Indiana will be compelled to cease operations if permission is not granted at an early date to increase their average selling price—the present price being less than the cost of production. This is one section where the Government failed to make an exception to a general ruling on price.

Due to labor difficulties in the eastern Kentucky field, also restrictions of car movement by the Louisville & Nashville Ry., few shipments have been made to this market, and few of the Chicago retailers are attempting to handle cannel or other grades of eastern Kentucky coal.

Prices per ton of 2000 lb., f.o.b. the mines are as follows:

	Williamson	Saline	Grundy, La-			
	and	and	Salle, Bureau			
	Franklin	Harrisburg	Peoria	Springfield	Carterville	and Will-
Steam lump	\$2.20@2.35	\$2.20@2.35	\$2.20@2.35	\$2.20@2.35	\$2.65@2.80	
Domestic lump	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80	
Egg or furnace	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80	
Sm'l. egg or nut	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80	
Stove	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80	
Chestnut	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80	
Pea	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80	
Washed egg	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80	
Washed stove	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80	
Washed nut	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.65@2.80	
Mine-run	1.95@2.10	1.95@2.10	1.95@2.10	1.95@2.10	2.40@2.55	
Screenings	1.70@1.85	1.70@1.85	1.70@1.85	1.70@1.85	2.15@2.30	
Washed slack	1.70@1.85	1.70@1.85	1.70@1.85	1.70@1.85	2.15@2.30	
Smokeless						
Clinton and	Knox and	Eastern	Pocahontas	West Va.		
Sullivan	Greene	Kentucky	W. Va.	Penna.	Hocking	Splint
Dom. lump	\$2.20@2.35	\$2.20@2.35	\$2.65@2.80	\$2.20@2.40	\$2.25@2.40	\$2.60@2.75
Steam lump	2.20@2.35	2.20@2.35	2.65@2.80	2.25@2.40	2.25@2.40	2.40@2.55
Egg	2.20@2.35	2.20@2.35	2.65@2.80	2.25@2.40	2.25@2.40	2.40@2.55
Sm'l. egg or	2.20@2.35	2.20@2.35	2.65@2.80	2.00@2.15	2.00@2.15	2.60@2.75
nut	2.20@2.35	2.20@2.35	2.65@2.80	1.75@1.90	1.75@1.90	2.10@2.25
Mine-run	1.95@2.10	1.95@2.10	2.40@2.55	1.75@1.90	1.75@1.90	2.10@2.25
Screenings	1.70@1.85	1.70@1.85	2.15@2.30	1.70@1.85	1.70@1.85	2.10@2.25

MILWAUKEE

The State of Wisconsin will supervise the distribution of coal supplies and also fix a scale of retail prices if any unfairness is detected.

The State Council of Defense does not intend to let up on the coal problem because of any action the Federal authorities have taken or may take in the future, but from now on until the end of the coming winter will endeavor to regulate the supply and distribution of coal so that no part of Wisconsin will be neglected.

Coal men have assured the Council that the supply will be larger than has been anticipated and that in their belief sufficient anthracite will be moved west before the close of navigation to meet the needs of the Central Western states. Should it become apparent at any time that this will not be the case, arrangements will be made to have Illinois coal shipped into the state by rail.

Retail prices for coal will also be fixed by the Council, if overcharging is indulged in by dealers. A law passed by the last Legislature empowers the Council to take over both fuel and food supplies whenever such action is deemed necessary in the interest of the public. It is planned to fix rates at the bin, in order to permit consumers in cities to provide their own agencies of delivery if unfairness is practiced in this respect. Prices in country communities will necessarily be varied because of differences in freight charges.

William N. Fitzgerald of Milwaukee has been appointed coal administrator by Governor Philipp. He will co-operate with the Federal authorities in matters pertaining to the coal supply.

Coal has been coming in more freely of late, but only one cargo of 9000 tons of hard coal was received during the past week. Receipts from the opening of navigation up to Sept. 1 were:

	Soft	Hard
1917	1,773,633	503,851
1916	2,347,608	510,971
1915	2,183,482	593,319
1914	2,377,600	585,935
Decrease from 1916	573,975	7,120

ST. LOUIS

A good market beginning to prevail, with some uncertainties to overcome. Coal plentiful, with growing demand. Car supply improved, and movement of cars better. Domestic demand not good. Public unaware of actual conditions. No Eastern coals.

The situation locally is clearing up, but there is still considerable confusion, and

the failure of the Government to notify the retail trade what the price to the consumer should be has caused a mixup.

On the first of the month new retail price lists were put into effect by most companies in St. Louis that showed considerable difference. As a result business is good in some sections, with nothing moving in other sections. The same condition prevails in a retail way throughout the country, as the dealers are afraid to make prices that may conflict with what the Government may prescribe.

The movement from the Williamson and Franklin County field is exceptionally good, and a surprising feature is the fact that there is plenty of this coal being shipped, and all operators are taking orders. Previous to the new prices some of the operators stated that they were oversold for several weeks. In some instances there has been unbilled coal at the mines.

	Fulton	Grundy, La-
	and	Salle, Bureau
	Franklin	Harrisburg
Steam lump	\$2.20@2.35	\$2.20@2.35
Domestic lump	2.20@2.35	2.20@2.35
Egg or furnace	2.20@2.35	2.20@2.35
Sm'l. egg or nut	2.20@2.35	2.20@2.35
Stove	2.20@2.35	2.20@2.35
Chestnut	2.20@2.35	2.20@2.35
Pea	2.20@2.35	2.20@2.35
Washed egg	2.20@2.35	2.20@2.35
Washed stove	2.20@2.35	2.20@2.35
Washed nut	2.20@2.35	2.20@2.35
Mine-run	1.95@2.10	1.95@2.10
Screenings	1.70@1.85	1.70@1.85
Washed slack	1.70@1.85	1.70@1.85

	Pocahontas	West Va.
Dom. lump	\$2.20@2.35	\$2.65@2.80
Steam lump	2.20@2.35	2.65@2.80
Egg	2.20@2.35	2.65@2.80
Sm'l. egg or	2.20@2.35	2.65@2.80
nut	2.20@2.35	2.65@2.80
Mine-run	1.95@2.10	2.40@2.55
Screenings	1.70@1.85	2.15@2.30

The car situation here has become somewhat better. One thing noticeable in general throughout the entire State of Illinois the past week is that the movement of both loads and empties shows improvement.

In the Standard district there is a general shortage of all sizes used principally for steam making. This is caused by the excessive railroad requirements. Screenings are especially strong and hard to get.

Contrary to expectations all the available open-market tonnage in the Standard field finds a ready market. This is remarkable, considering the fact that high-grade fuel can be purchased for the same price as Standard, with only a 15c. higher freight rate.

On the other hand, several operators in the field indicate that they would prefer to have the Government operate their properties.

The local distributors of smelting coal refuse to take orders, claiming that they cannot handle on a margin of 15c. a ton.

The coke situation here is a peculiar one, as no prices have been fixed, and the public believes that a proper reduction should be made on coke the same as on coal when for domestic use.

The wholesale price on gas house coke is \$9, f.o.b. cars here, and \$10 for byproduct domestic.

The maximum on the coals for St. Louis is \$2.35 for lump, egg and nut, \$2.10 for mine-run, and \$1.85 for screenings, with a rate of 87½c. for Williamson and Franklin County, and 72½c. for Mt. Olive and Standard.

The prevailing circular per net ton f.o.b. mine is:

	Williamson	Franklin	Mt. Olive	County and Staunton	Standard
6-in. lump	\$2.20@2.35	\$2.20@2.35	\$2.20@2.35	\$2.20@2.35	\$2.20@2.35
3x6-in. egg	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35
2x3-in. nut	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35
No. 2 nut	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35
No. 3 nut	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35
No. 4 nut	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35
No. 5 nut	1.70@1.85	1.70@1.85	1.70@1.85	1.70@1.85	1.70@1.85
2-in. sergs	1.70@1.85	1.70@1.85	1.70@1.85	1.70@1.85	1.70@1.85
2-in. lump					2.20@2.35
3-in. lump					2.20@2.35
Steam egg	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35	2.20@2.35
Mine run	1.95@2.10	1.95@2.10	1.95@2.10	1.95@2.10	1.95@2.10

Washed:

No. 1	2.20@2.35	\$2.20@2.35	\$2.20@2.35
No. 2	2.20@2.35	2.20@2.35	2.20@2.35
No. 3	2.20@2.35	2.20@2.35	2.20@2.35
No. 4	2.20@2.35	2.20@2.35	2.20@2.35
No. 5	1.70@1.85	1.70@1.85	1.70@1.85

Williamson and Franklin County rate 87½c. Other fields, 72½c.

SEATTLE

Coal prices as fixed by the President are too low to permit operation and many mines will close. Canadian coal can, however, be imported and sold without price restriction.

If the coal prices fixed by President Wilson's proclamation for this state prevail, about six mines, producing over 750,000 tons of coal, of which 200,000 tons is used for coking purposes, will close, coal operators predict. Some of the others can operate at a slight loss and will do so, while some of the smaller operators with a heavy overhead charge might decide to continue operation on the theory that it would be cheaper to operate at a loss than to close down and carry the heavy overhead expense that a shutdown involves.

There is not one operator in the state who believes that any mine in Washington could turn out the quality of coal now sold at prices fixed by the President. An alternative one big operator suggests and one that he may try is that of offering for sale mine-run coal as it actually comes from the colliery. It is admitted by coal operators that Washington mine-run cannot be burned successfully and that the public would be indignant if offered real mine-run coal. This is, however, the quality specified in the President's proclamation.

Virtually all Washington coal is washed after being mined. In the washing and segregation of the coal into various sizes there is a loss running from 10 to 40 per cent. At Carbonado, for instance, 3333 lb. of mine-run must be sent through the washing plant to obtain a short ton of mine run coal such as now is placed on the market.

Local dealers estimate that there is a possibility that by selling everything as mine-run, Black Diamond and the Northwestern Improvement Co. mines, at Roslyn and Cle Elum, might meet operating expenses. It is declared absolutely impossible for the mines at Wilkeson and Carbonado districts to operate under the proposed tariffs. The Pacific Coast Coal Co. makes no secret of the fact that the South Prairie mine would have to close down and three other properties are reported as almost certain to shut down unless a revision in prices is made.

The President's order fixing coal prices has no bearing on the price that Canadian coal might sell for in Seattle. Though Canadian authorities have declared they will restrict the export of coal, there are outstanding contracts that would be filled, and in event of a fuel shortage other Canadian coal, sold without restriction as to price, could be brought in.

A committee composed of W. E. Pearce, sales manager of the Carbon Hill Coal Co., N. D. Moore, vice president of the Pacific Coast Coal Co., D. S. Hanley, general manager of the Carbon Hill Coal Co., and D. C. Bottin, commissioner of the Washington Coal Operators' Association, will leave for Washington shortly, to present the claims of Washington coal operators and to urge upon the administration the advisability of making a grouping of the coal mines of the state for rate-fixing purposes, as has been done in the case of half a dozen or more of the Eastern and Southern states.

Foreign Markets

Reported by Hull, Blyth & Co., of London and Cardiff

Aug. 16—Coal business has been on a restricted basis. There has been a better demand by the authorities, and collieries are mostly working full time.

Best Welsh steam..... \$8.02
Best seconds..... 7.65
Seconds..... 7.47
Best dry coals..... 7.29
Best Monmouthshires..... 7.29
Seconds..... 7.05
Best Cardiff smalls..... 5.59
Cargo smalls..... 4.86

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—The supply of tonnage has sensibly improved during the week, although it in no wise approaches the needs of the market.

Gibraltar..... \$21.26
Marseilles..... 21.79
Genoa..... 24.60
Naples..... 23.86
87½c. Other fields, 72½c.
Alexandria..... 41.31
Port Said..... \$38.88
Las Palmas..... 18.22
St. Vincent..... 19.42
River Plate..... 27.32

Current Prices—Materials and Supplies

IRON AND STEEL

PIG IRON—Below are the present quotations, with a comparison of a month and a year ago:

CINCINNATI	Aug. 28, 1917	One Month Ago	One Year Ago
No. 2 Southern foundry	\$49.90	\$49.90	\$16.90
No. 2 Northern foundry	52.26	56.25	19.76
NEW YORK			
No. 2X Northern foundry	52.75	54.25	19.50
No. 2 plain Northern foundry	52.50	53.75	19.25
BIRMINGHAM			
No. 2 Southern foundry	47.00	47.00	14.00
CHICAGO			
No. 2 Northern foundry	55.00	55.00	18.00
PITTSBURGH			
Bessemer iron*	52.95	55.95	21.95
Basic iron*	50.95	53.95	18.95

*These prices include the freight charge from the valley to the Pittsburgh district. †Delivered Tidewater, New York.

STRUCTURAL MATERIAL—The following are the base prices, f.o.b. mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

New York		San	
Pitts.	Aug. 28, 1 Yr.	St.	Chi- cago
burgh	1917	Ago	Fran- cisco
Beams, 3 to 15 in.	\$4.50	\$5.25	\$2.50
Channels, 3 to 15 in.	4.80	5.25	2.50
Angles, 3 to 6 in., $\frac{1}{4}$ in. thick	4.50	5.25	2.50
Tees, 3 in. and larger	4.50	5.30	2.50
Plates	9.00	10.00	2.90
		10.05	10.00
		8.00	10.00

BAR IRON—Prices in cents per pound at cities named are as follows:

Pittsburgh	Cincinnati	St. Louis	Denver	Birmingham
Aug. 28, 1917	4.00	4.65	4.55	4.85

NAILS—Prices per keg from warehouse in cities named:

Mill.	Cin-	St.	Bir-	San
Pittsburgh	cinnati	Louis	Denver	mingham
Wire	\$3.50	\$4.00	\$4.00	\$4.05
Cut	3.75	4.00	5.00	4.10

TRACK SUPPLIES—Prices are base per 100 lb. f.o.b. Pittsburgh, and from warehouse at cities named:

Mill.	Cin-	St.	Bir-	San
Pittsburgh	cinnati	St. Louis	Denver	mingham
Standard railroad spikes, $\frac{1}{4}$ in. and larger	\$7.00	\$4.75	\$5.75	\$4.85
Track bolts or nuts	7.00 to 8.00	7.00	Premium	5.55
Standard section angle bars	3.25	...	Premium	4.40

COLD DRAWN STEEL SHAFTING—From warehouse to consumers requiring fair-sized lots, the following discounts held on Apr. 30, 1917:

Cleveland	Cincinnati	St. Louis	Denver	Birmingham
List + 10%	+15%	+10%	+35%	+30%

HORSE AND MULE SHOES—Warehouse prices per 100 lb. in cities named:

Mill.	Pittsburgh	Cincinnati	St. Louis	Denver	Birmingham
Straight	\$4.75	\$6.75	\$7.00	\$7.75	\$6.75
Assorted	4.90	7.25	7.15	8.00	7.25

CAST-IRON PIPE—The following are prices per net ton for carload lots:

New York		St. Louis	
Aug. 28, 1 Mo.	One	Birming-	Chi-
1917	Year Ago	ham	cago
1917	Ago	Yr. Ago	ham
4 in.	\$68.50	\$68.50	\$34.00
in. and over	65.50	65.50	31.00
	60.00	60.00	60.00
	65.50	65.50	61.00
	69.00	73.00	69.00

Gas pipe and 16-ft. lengths are \$1 per ton extra.

STEEL RAILS—The following quotations are per 100 lb. f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra:

Pittsburgh		Chicago	
Aug. 28, 1917	One	Aug. 28, 1917	One
1917	Year Ago	1917	Year Ago
Standard bessemer rails	\$38.00	\$33.00	\$38.00
Standard openhearth rails	40.00	35.00	40.00
Light rails, 8 to 10 lb.	83.00 to 84.00*	50.00	68.00
Light rails, 12 to 14 lb.	82.00 to 83.00*	49.00	67.00
Light rails, 25 to 45 lb.	75.00 to 80.00*	47.00	65.00

*Demand for light rails active and mills are obtaining premiums. Rerolled rails as valuable as new.

OLD MATERIAL—Prices per net ton in Chicago and St. Louis (including delivery to buyer's works and freight transfer charges):

Chicago		St. Louis	
Aug. 28, 1917	One Month Ago	Aug. 28, 1917	One
No. 1 railroad wrought	\$34.00	\$35.00	\$33.00
Stove plate	17.50	18.50	16.50
No. 1 machinery cast	27.50	28.50	23.00
Machine shop turnings	16.50	17.00	14.50
Cast borings	16.50	17.50	14.00
Railroad malleable cast	30.50	29.00	27.00

COAL BIT STEEL—Warehouse price per pound is as follows:

New York	Firmingham	Denver
\$0.14	\$0.14	\$0.16

PIPE—The following discounts are for carload lots f.o.b. Pittsburgh, as per basing card of July 2, 1917, for iron pipe: May 1, for steel:

BUTT WELD		IRON	
Inches	Steel	Black	Galvanized
$\frac{3}{4}$ to 3	49%	35 $\frac{1}{2}$ %	34 $\frac{1}{2}$ %
2	42%	29 $\frac{1}{2}$ %	26%
2 $\frac{1}{2}$ to 6	45%	32 $\frac{1}{2}$ %	28%
7 to 12	42%	28 $\frac{1}{2}$ %	25%
13 and 14	32 $\frac{1}{2}$ %	27 $\frac{1}{2}$ %	22%
15	30%	25 $\frac{1}{2}$ %	19%

BUTT WELD.		EXTRA STRONG PLAIN ENDS	
Inches	Steel	Black	Galvanized
$\frac{3}{4}$ to 1 $\frac{1}{2}$	47%	34 $\frac{1}{2}$ %	33%
2 to 3	48%	35 $\frac{1}{2}$ %	18%

From warehouses at the places named the following discounts hold for steel pipe:

Black		St. Louis	
New York	Chicago	St. Louis	
38%	42.8%	34.27%	
31 $\frac{1}{2}$ to 6 in. lap welded	34.8%	27.27%	
7 to 12 in. lap welded	35.8%	21.27%	

Galvanized		St. Louis	
New York	Chicago	St. Louis	
22%	27.8%	19.27%	
3 $\frac{1}{2}$ to 3 in. butt welded	List + 20%	24.8%	13.27%
7 to 12 in. lap welded	List + 20%	20.8%	6.27%

Malleable fittings, Class B and C, from New York stock sell at list price. Cast iron, standard sizes, 15 and 5%.

SHOP SUPPLIES

NUTS—From warehouse at the places named, on fair-sized orders, the following amount is deducted from list:

New York		Cleveland		Chicago	
Aug. 28, 1917	One Year Ago	Aug. 28, 1917	One Year Ago	Aug. 28, 1917	One Year Ago
Hot pressed square	List	\$2.00	\$1.65	\$2.75	\$3.00
Hot pressed hexagon	List	2.00	1.50	3.00	3.25
Cold punched square	List	1.50	1.40	1.50	1.60
Cold punched hexagon	List	2.00	1.40	3.00	3.50

Semifinished nuts sell at the following discounts from list price:

Aug. 28, 1917		One Year Ago	
New York	50%	50	10-10%
Cleveland	50%	60	60%
Chicago	50%	60	60-10%

40%.

MACHINE BOLTS—Warehouse discounts in the following cities:

New York		Cleveland		Chicago	
% by 4 in. and smaller	30%	35 $\frac{1}{2}$ %	40-10%	40%	
Larger and longer up to 1 in. by 30 in.	15%	25-5%	35-5%	30-5%	

For east-iron washers the base price per 100 lb. is as follows:

New York	Cleveland	Chicago	St. Louis
\$2.25	\$4.50	\$4.50	\$3.00

New York, \$2.25 Cleveland, \$4.50 Chicago, \$4.50 St. Louis, \$3.00

For cast-iron washers the base price per 100 lb. is as follows:

| New York | Cleveland | Chicago | St. Louis |
</
| --- | --- | --- | --- |

HOSE—Following are prices of various classes of hose:

	Fire	50-Ft. Lengths			
		65c. per ft.			
Underwriters' 2 1/2-in.		40-10%			
Common, 2 1/2-in.		40-10%			
Air					
First Grade	Second Grade	Third Grade			
1/4-in. per ft.	\$0.55	\$0.30	\$0.25		
Steam—Discounts from list					
First grade...	30%	Second grade...	30-5%	Third grade...	40-10%

LEATHER BELTING—Present discounts from list in cities named:

	Medium Grade	Heavy Grade
Cincinnati	40%	35%
St. Louis	45%	40%
Denver	40%	45%
Birmingham	35-5%	40%

RAWHIDE LACING—40% off list.

PACKING—Prices in cities named are as follows:

Valve and Stuffing-Box	Cincinnati	Denver	St. Louis	Chicago
Twisted plain, 25-lb. cartons	\$1.35	\$1.40	\$1.25	\$0.80
Braided graphite, 25-lb. cartons	1.55		1.25	.90
Braided plain, 25-lb. cartons	1.35	.60	1.50	1.00
Braided graphite, 25-lb. cartons	1.55	.60	1.50	1.10
Steam (in 25- and 50-lb. cartons)				
First grade	1.00	1.00	.80	.75
Second grade	.35	.6050
Piston (in 25- and 50-lb. cartons)				
Asbestos, duck and rubber	.90	.60	1.50	1.25
Flax, first grade	.45	.60	.60	.85
Rubber and duck	.75	.60	.75	.90

MANILA ROPE—For rope smaller than 5/8-in. the price is 1/2 to 2c. extra; while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: 5/8-in., 8 ft.; 7/8-in., 6; 1 1/2-in., 4 1/2; 1-in., 3 1/2; 1 1/4-in., 2 ft.; 4-in., 1 1/2 ft. Following is the price per pound for 5/8-in. and larger, in 1200-ft. coils:

Boston	\$0.34	New Orleans	\$0.31
New York	.32 1/2	Seattle	.31 1/2
Denver	.34	St. Paul	.31 1/2
Kansas City	.31 1/2	Birmingham	.34

WIRE ROPE—Discounts from list price on regular grades of bright and galvanized are as follows:

	New York	San Francisco				
Aug. 28, 1917	One Year Ago	St. Louis Chicago Denver				
Galvanized	10-2 1/2 %	35-2 1/2 %	20-2 1/2 %	20-2 1/2 %	5-2 1/2 %	15 %
Bright	20-2 1/2 %	35-2 1/2 %	20-2 1/2 %	20-2 1/2 %	10-2 1/2 %	5 %

PIPE AND BOILER COVERING—Below are discounts and part of standard lists:

Pipe Size	Standard Thickness	BLOCKS AND SHEETS		
		Per Lin.Ft.	Thickness	Price per Sq.Ft.
1-in.	\$0.27	1/2-in.		\$0.27
2-in.	.36	1-in.	.30	
6-in.	.80	1 1/2-in.	.45	
4-in.	.60	2-in.	.60	
3-in.	.45	2 1/2-in.	.75	
8-in.	1.10	3-in.	.90	
10-in.	1.30	3 1/2-in.	1.05	
85% magnesia high pressure				
Air cells for low-pressure heating and return lines				
		4-ply	15% off	
		3-ply	58% off	
		2-ply	60% off	
			62% off	

LINSEED OIL—These prices are per gallon:

New York	Cleveland	Chicago	St. Louis			
Aug. 28, 1917	Aug. 28, 1917	Aug. 28, 1917	Aug. 28, 1917			
Avg. 1 Yr.	Avg. 1 Yr.	Avg. 1 Yr.	Avg. 1 Yr.			
Raw in barrels...	\$1.26	\$0.75	\$1.30	\$0.75		
5-gal. cans	1.36	.85	1.40	.85		
				1.37	.85	1.26

WHITE AND RED LEAD in 500-lb. lots sell as follows in cents per pound:

	Red	White				
Aug. 28, 1917	1 Year Ago	Aug. 28, 1917 1 Yr. Ago				
Dry	In Oil	Dry				
100-lb. keg	13.25	13.50	10.50	11.00	13.00	10.50
25- and 50-lb. kegs	13.50	13.50	10.75	11.25	13.25	10.75
12 1/2-lb. keg	13.75	14.00	11.00	11.50	13.50	11.00
1- to 5-lb. cans	15.25	15.50	12.50	12.50	15.50	12.50

CALCIUM CARBIDE—Price f.o.b. cars at warehouse points in Eastern States is \$90 per ton for Cameo, \$95 for Union.

COMMON BRICK—The prices per 1000 in cargo or carload lots are as follows:

Cincinnati	\$13.50	Birmingham (clay)	\$7.50
St. Louis, salmon	8.00	Birmingham (shale)	8.50
Denver	8.00		

FIRE BRICK—Price f.o.b. works:

Silica (per M)	\$55.00-60.00	Cincinnati	Denver	Birmingham
Fire clay (per M)	48.00-50.00	\$23.00	\$22.00	
Magnesite (per ton)	135.00-145.00			
Chrome (per ton)	125.00-135.00			
St. Louis—High-grade	\$55 to \$65	St. Louis grade	\$40 to \$50	

PREPARED ROOFINGS—Standard grade rubbered surface, complete with nails and cement, costs per square as follows in New York and Chicago:

	1-Ply	2-Ply	3-Ply
No. 1 grade	\$1.25	\$1.40	\$1.45
No. 2 grade	1.10	1.25	1.40
Asbestos asphalt-saturated felt (14 lb. per square)	100 lb.		
Slate-surfaced roofing (red and green) in rolls of 108 sq.ft.			
\$1.85 per roll in carload lots and \$1.10 for smaller quantities.			
Shingles, red and green slate finish, cost \$4.75 per square in carloads.			
\$5 in smaller quantities, in Philadelphia.			

ROOFING MATERIALS—Prices per ton f.o.b. New York or Chicago:

	Carload Lots	Less Than Carload Lots
Tar felt (14 lb. per square of 100 sq.ft.)	\$61.00	\$62.00
Tar pitch (in 400-lb. bbl.)	15.00	16.50
Asphalt pitch (in barrels)	29.00	30.50
Asphalt felt	60.00	62.00

CORRUGATED SHEETS—Price of corrugated sheets (2 1/4-in. corrugations) in cents per pound:

Gage	Birmingham	St. Louis	Denver*
18-20	Black		
28	Black		
28	Galvanized		
18-20	Galvanized		

*Price per square of 100 sq.ft.

HOLLOW TILE—The price per 1000 in carload lots f.o.b. mine is as follows:

	4 x 12 x 12	8 x 12 x 12
Cincinnati	\$68.80	\$120.00
St. Louis	60.00	110.00
Denver, per ton	90.00	170.00
Birmingham	52.00	97.50

LUMBER—Price of yellow pine per M in carload lots:

	1-In. Rough	10 In. x 16 Ft.	2-In. T. and G.	8 x 8 In. x 20 Ft.
Denver	\$44.00	\$40.00	\$40.00	
St. Louis	36.50	27.00	35.50	
Birmingham	24.00	24.00	24.00	

Lumber—Price per M in carload lots:

	1-In. Rough	10 In. x 16 Ft. and Under	2-In. T. and G.
Y.P.	Fir	Hemlock	Y.P. Fir
Kansas City	\$44.00	\$44.50	\$43.00
Seattle	18.50	18.50	18.50
New Orleans	38.00	51.00	33.50
St. Paul	59.00

	8 x 8-In. x 20 Ft. and Under	20 Ft. and Under
Y.P.	Fir	Hemlock
Kansas City	\$39.00	\$35.00
Seattle	18.50	18.50
New Orleans	28.00	31.50
St. Paul	40.00	32.00

COPPER WIRE—Prices per 1000 ft. for rubber-covered wire:

	Denver	St. Louis	Birmingham
Single	Single	Double	Double
No. 14	\$12.75	\$17.25	\$33.65
10	27.50	31.45	62.30
8	39.55	43.45	87.00
6	66.95	71.95	143.00
4	96.50	101.50	110.35
2	144.50	161.00	146.25
1	187.50	211.00	187.65
0	224.95	256.50	257.40
00	302.20	316.00	316.35
000	370.40	385.00	389.25
0000	425.25	469.50	475.20
			486.90

EXPLOSIVES—Price per pound in 200-lb. lots at cities named:

	Low Freezing	Gelatin	Black Powder*

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